

SUPPLEMENT
TO
CARNEGIE
POCKET COMPANION

TWENTY-FIRST EDITION



CARNEGIE STEEL COMPANY

PITTSBURGH, PA.

POCKET COMPANION

FOR

ENGINEERS, ARCHITECTS AND BUILDERS

CONTAINING

USEFUL INFORMATION AND TABLES

APPLICABLE TO ANY PART OF

THE

UNITED STATES

CALCULATED BY J. H. COOPER, JR.

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NEW YORK

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POCKET COMPANION

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MANUFACTURED BY

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SUPPLEMENT

TO

THE TWENTY-FIRST EDITION

ISSUED JANUARY 1, 1920

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CARNEGIE STEEL COMPANY
Pittsburgh, Pa.

First Edition, April 1, 1921

THE first edition of Carnegie Pocket Companion appeared in 1872 and was issued by Carnegie, Kloman & Company, Proprietors, Union Iron Mills, Pittsburgh, Pa.

So far as practicable each successive edition has been placed abreast of the most approved methods in structural design and has had incorporated in it data on all new structural sections rolled by Carnegie Steel Company, together with such modifications in the manufacture of earlier sections as might affect structural practice.

The twenty-first edition was issued as of January 1, 1920. Since that date the Association of American Steel Manufacturers has given careful consideration to the manufacture of structural shapes and has agreed to introduce certain modifications in methods and profiles which will tend to make the practice of the mills more consistent and uniform.

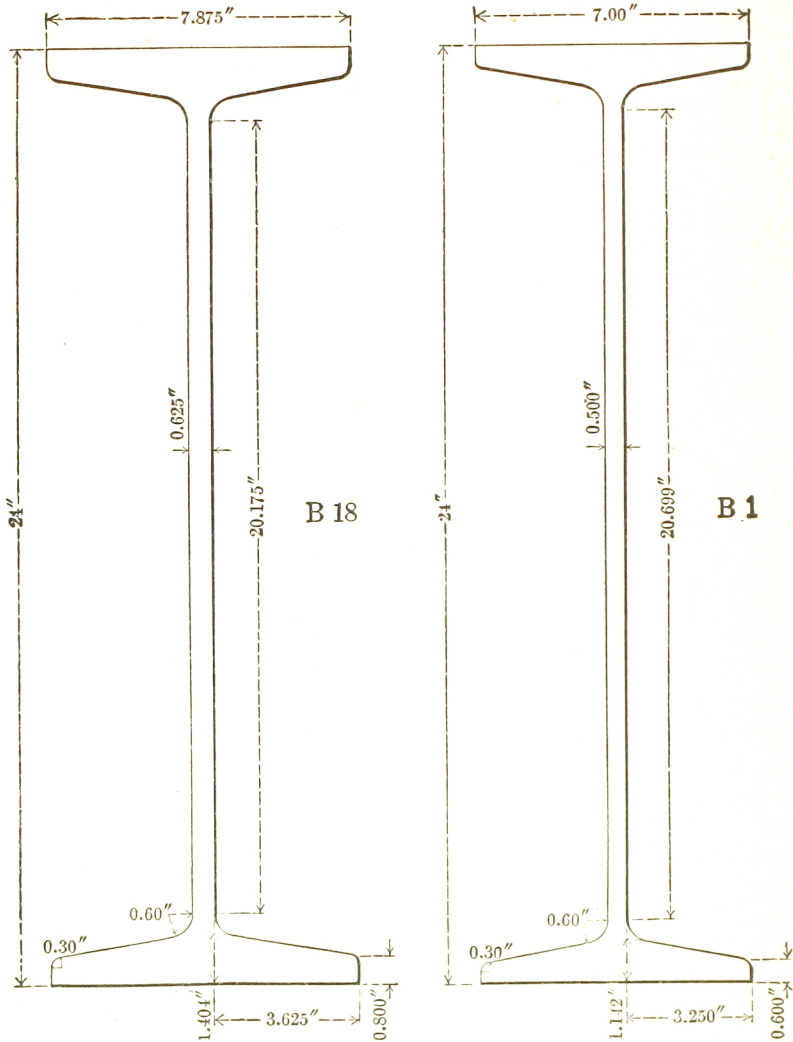
To advise users of structural shapes as to these modifications, this Supplement to the twenty-first, and earlier, editions of Carnegie Pocket Companion is issued. It contains all significant variations from that edition, and all of very much importance, from the nineteenth and twentieth editions. In it the weights of beams and channels have been adjusted to conform to the action taken by the Association of American Steel Manufacturers effective as of September 1, 1920, by virtue of which fillets and roundings are included in the computation of weights. The dimensions and properties of sections of intermediate and maximum thicknesses have also been recomputed. The safe load tables have not yet been adjusted to the new properties but are sufficiently exact for all practical uses as now printed.

Changes have also been made in the section numbers of standard beams and particularly in the section numbers of angles. Purchasers are, therefore, requested to be sure to show the new section numbers on all orders.

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CARNEGIE STEEL COMPANY

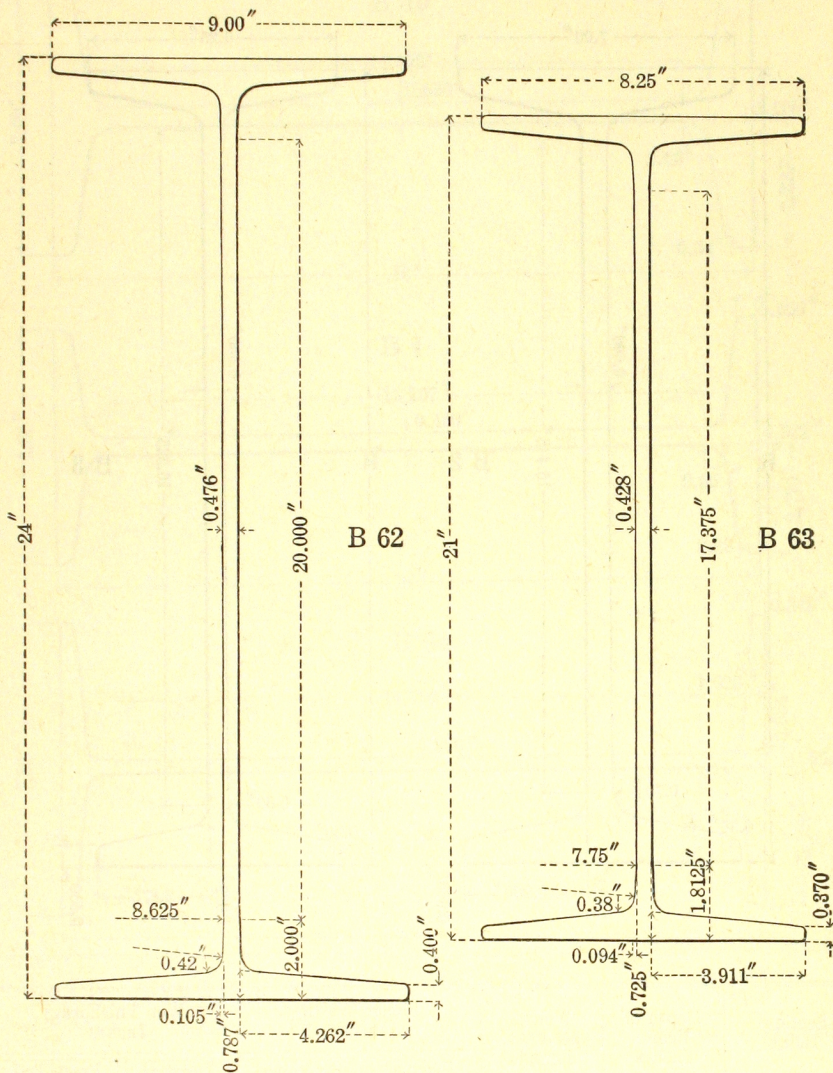
STRUCTURAL BEAMS—Continued



Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 18 (Old No. B 24)	24	115.0	7.987	$7\frac{63}{64}$	0.737	$4\frac{7}{64}$
		110.0	7.925	$7\frac{59}{64}$	0.675	$4\frac{3}{64}$
		105.9	7.875	$7\frac{7}{8}$	0.625	$\frac{5}{8}$
B 1	24	100.0	7.247	$7\frac{1}{4}$	0.747	$\frac{3}{4}$
		95.0	7.186	$7\frac{3}{16}$	0.686	$1\frac{1}{16}$
		90.0	7.124	$7\frac{1}{8}$	0.624	$\frac{5}{8}$
		85.0	7.063	$7\frac{1}{16}$	0.563	$\frac{9}{16}$
		79.9	7.000	7	0.500	$\frac{1}{2}$

BEAMS

STRUCTURAL BEAMS—Continued

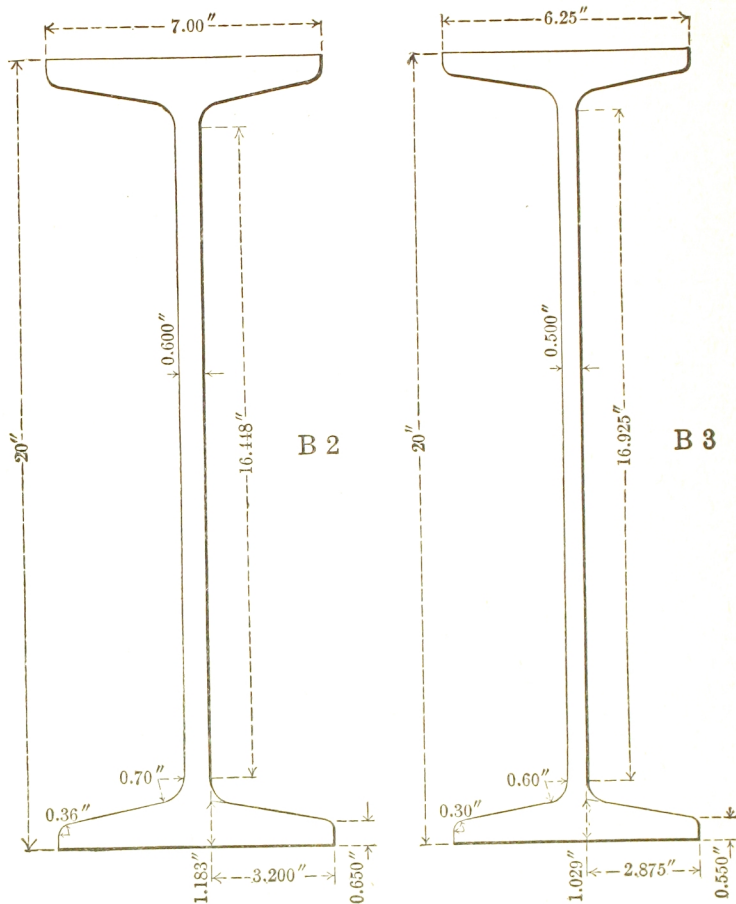


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
*B 62	24	74.2	9.00	9	0.476	$15\frac{1}{32}$
*B 63	21	60.4	8.25	$8\frac{1}{4}$	0.428	$27\frac{1}{64}$

*Supplementary Beam.

CARNEGIE STEEL COMPANY

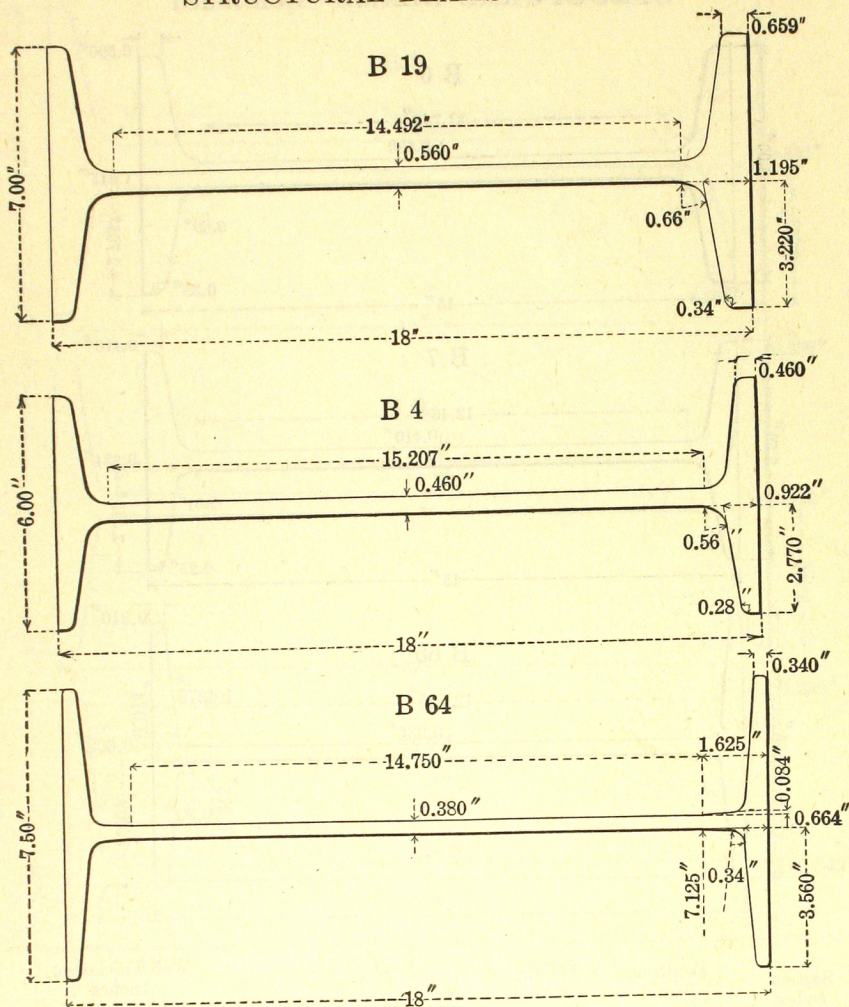
STRUCTURAL BEAMS—Continued



Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 2	20	100.0	7.273	$7\frac{17}{64}$	0.873	$\frac{7}{8}$
		95.0	7.200	$7\frac{13}{64}$	0.800	$\frac{51}{64}$
		90.0	7.126	$7\frac{1}{8}$	0.726	$\frac{23}{32}$
		85.0	7.053	$7\frac{3}{64}$	0.653	$\frac{21}{32}$
		81.4	7.000	7	0.600	$\frac{19}{32}$
B 3	20	75.0	6.391	$6\frac{25}{64}$	0.641	$\frac{41}{64}$
		70.0	6.317	$6\frac{5}{16}$	0.567	$\frac{9}{16}$
		65.4	6.250	$6\frac{1}{4}$	0.500	$\frac{1}{2}$

BEAMS

STRUCTURAL BEAMS—Continued

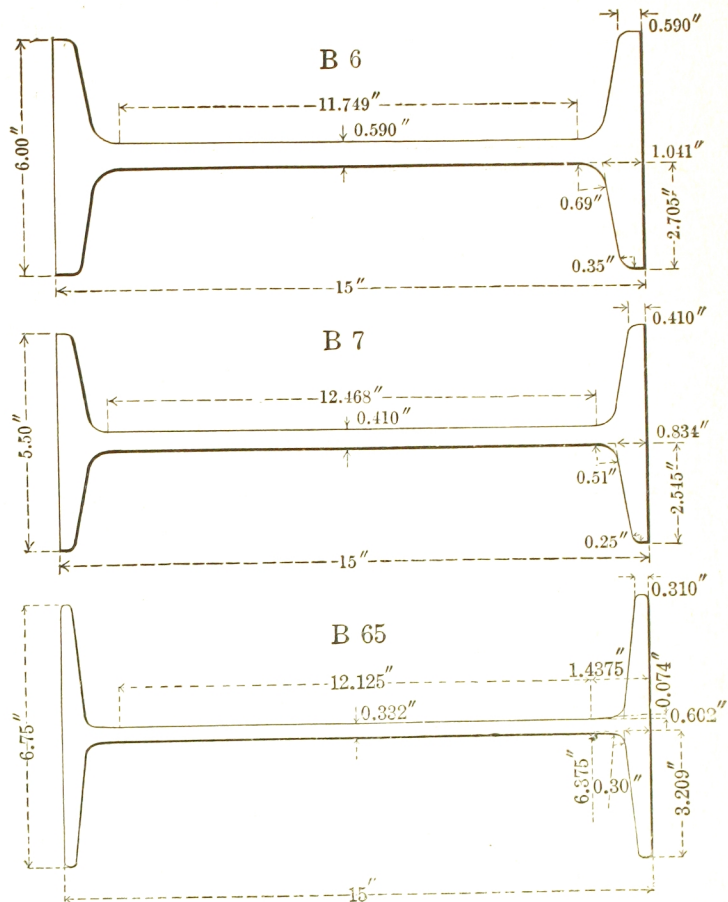


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 19 (Old No. B 81)	18	90.0	7.236	$7\frac{15}{64}$	0.796	$\frac{51}{64}$
		85.0	7.154	$7\frac{5}{32}$	0.714	$\frac{23}{32}$
		80.0	7.072	$7\frac{5}{64}$	0.632	$\frac{5}{8}$
		75.6	7.000	$\frac{7}{8}$	0.560	$\frac{9}{16}$
B 4 (Old No. B 80)	18	70.0	6.251	$6\frac{1}{4}$	0.711	$\frac{23}{32}$
		65.0	6.169	$6\frac{11}{64}$	0.629	$\frac{5}{8}$
		60.0	6.087	$6\frac{3}{32}$	0.547	$\frac{35}{64}$
		54.7	6.000	$\frac{6}{8}$	0.460	$\frac{29}{64}$
*B 64	18	48.2	7.500	$7\frac{1}{2}$	0.380	$\frac{3}{8}$

*Supplementary Beam.

CARNEGIE STEEL COMPANY

STRUCTURAL BEAMS—Continued

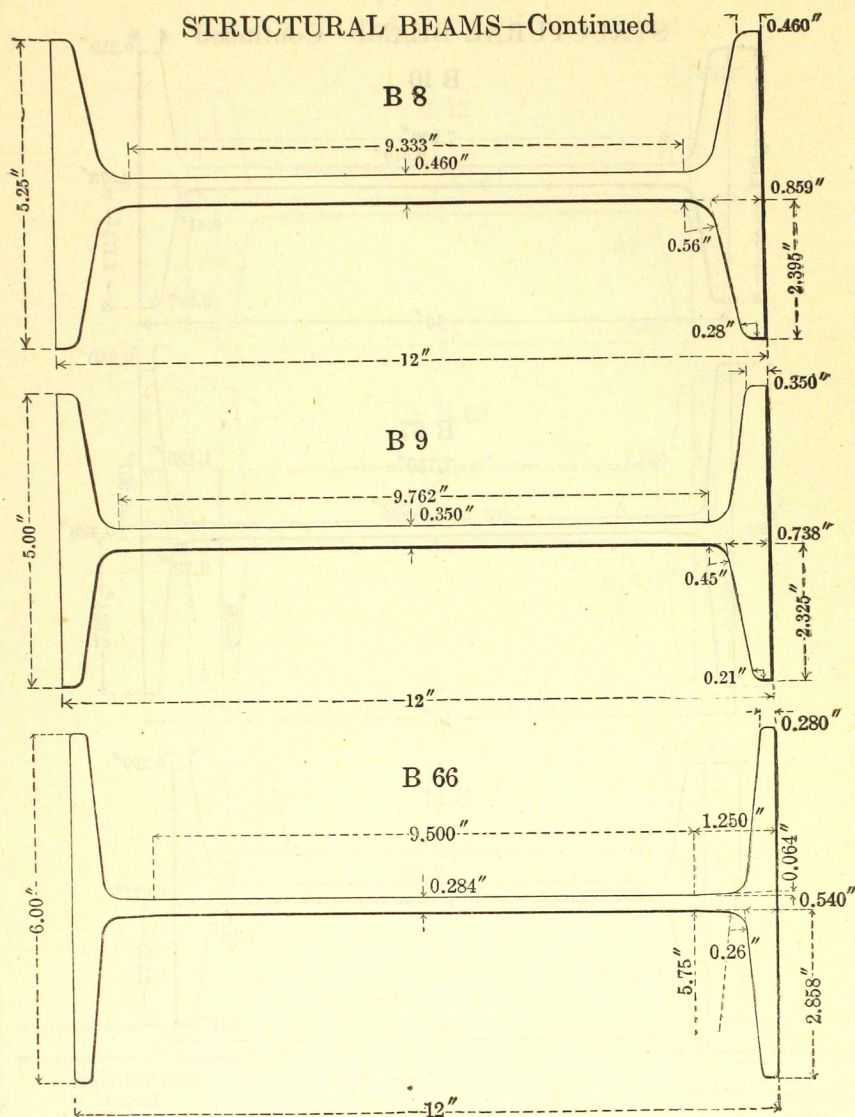


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 6 (Old No. B 5)	15	75.0	6.278	6 ⁹ / ₃₂	0.868	⁷ / ₈
		70.0	6.180	6 ³ / ₁₆	0.770	4 ⁹ / ₆₄
		65.0	6.082	6 ⁵ / ₆₄	0.672	4 ³ / ₆₄
		60.8	6.000	6	0.590	1 ⁹ / ₃₂
B 7	15	55.0	5.738	5 ¹⁷ / ₆₄	0.648	4 ¹ / ₆₄
		50.0	5.640	5 ¹¹ / ₆₄	0.550	3 ⁵ / ₆₄
		45.0	5.542	5 ³⁵ / ₆₄	0.452	2 ⁹ / ₆₄
		42.9	5.500	5 ¹ / ₂	0.410	1 ³ / ₃₂
*B 65	15	37.3	6.750	6 ³ / ₄	0.332	2 ¹ / ₆₄

*Supplementary Beam.

BEAMS

STRUCTURAL BEAMS—Continued

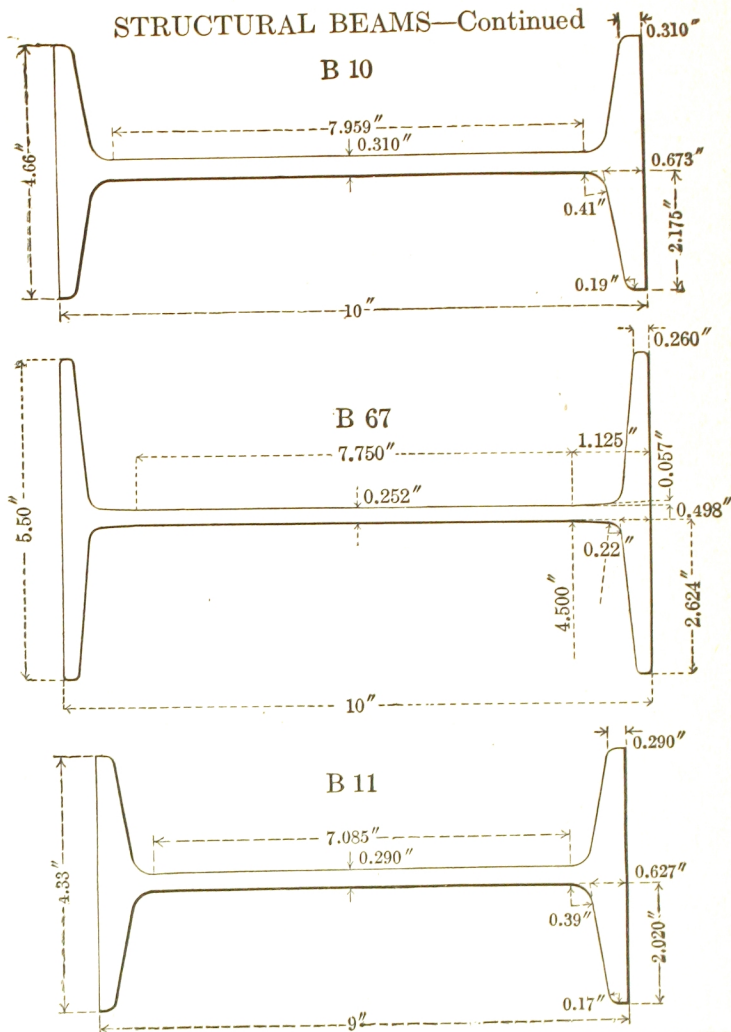


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 8	12	55.0	5.600	$5\frac{19}{32}$	0.810	$1\frac{3}{16}$
		50.0	5.477	$5\frac{31}{64}$	0.687	$1\frac{1}{16}$
		45.0	5.355	$5\frac{23}{64}$	0.565	$\frac{9}{16}$
		40.8	5.250	$5\frac{1}{4}$	0.460	$2\frac{9}{64}$
B 9	12	35.0	5.078	$5\frac{5}{64}$	0.428	$2\frac{7}{64}$
		31.8	5.000	5	0.350	$1\frac{1}{32}$
*B 66	12	27.9	6.000	6	0.284	$\frac{9}{32}$

*Supplementary Beam.

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STRUCTURAL BEAMS—Continued

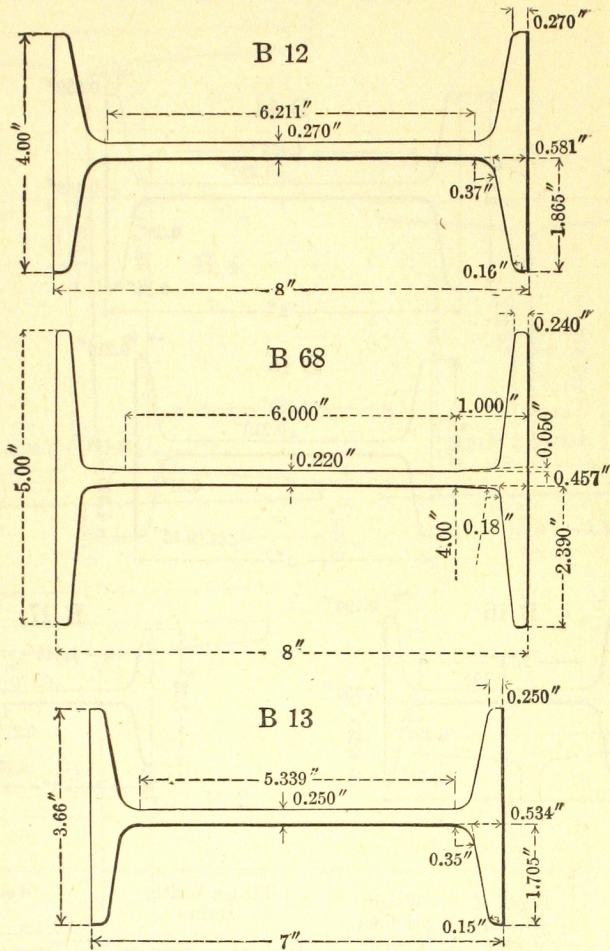


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 10 (Old No. B 11)	10	40.0	5.091	5 $\frac{3}{32}$	0.741	4 $\frac{7}{64}$
		35.0	4.944	4 $\frac{15}{16}$	0.594	1 $\frac{9}{32}$
		30.0	4.797	4 $\frac{51}{64}$	0.447	2 $\frac{9}{64}$
		25.4	4.660	4 $\frac{21}{32}$	0.310	5 $\frac{1}{16}$
*B 67	10	22.4	5.500	5 $\frac{1}{2}$	0.252	1 $\frac{1}{4}$
B 11 (Old No. B 13)	9	35.0	4.764	4 $\frac{49}{64}$	0.724	2 $\frac{3}{32}$
		30.0	4.601	4 $\frac{19}{32}$	0.561	9 $\frac{1}{16}$
		25.0	4.437	4 $\frac{7}{16}$	0.397	2 $\frac{5}{64}$
		21.8	4.330	4 $\frac{21}{64}$	0.290	1 $\frac{9}{64}$

*Supplementary Beam.

BEAMS

STRUCTURAL BEAMS—Continued

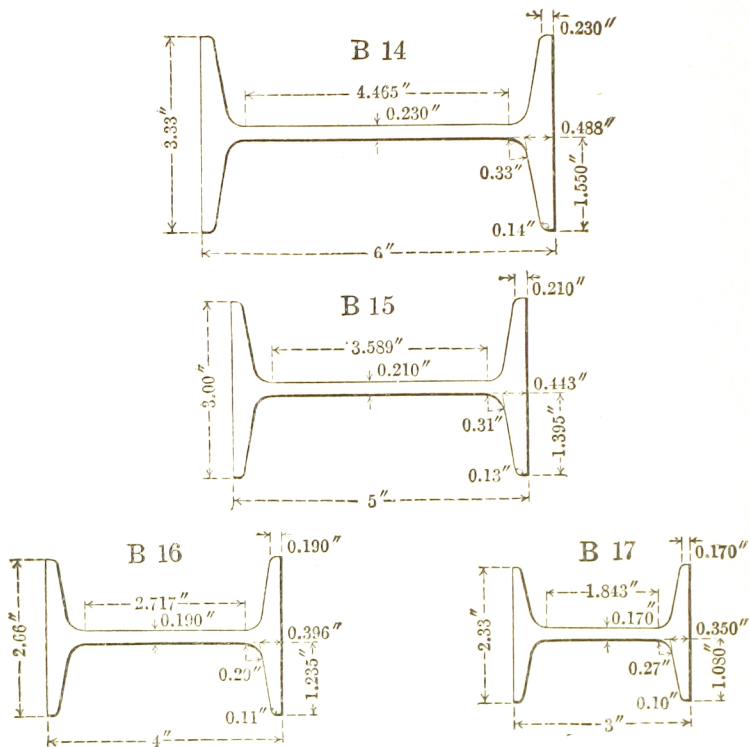


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 12 (Old No. B 15)	8	25.5	4.262	$4\frac{17}{64}$	0.532	$1\frac{7}{32}$
		23.0	4.171	$4\frac{11}{64}$	0.441	$\frac{7}{16}$
		20.5	4.079	$4\frac{5}{64}$	0.349	$1\frac{1}{32}$
		18.4	4.000	4	0.270	$1\frac{7}{64}$
*B 68	8	17.5	5.000	5	0.220	$\frac{7}{32}$
B 13 (Old No. B 17)	7	20.0	3.860	$3\frac{55}{64}$	0.450	$2\frac{9}{64}$
		17.5	3.755	$3\frac{3}{4}$	0.345	$1\frac{1}{32}$
		15.3	3.660	$3\frac{21}{32}$	0.250	$\frac{1}{4}$

*Supplementary Beam.

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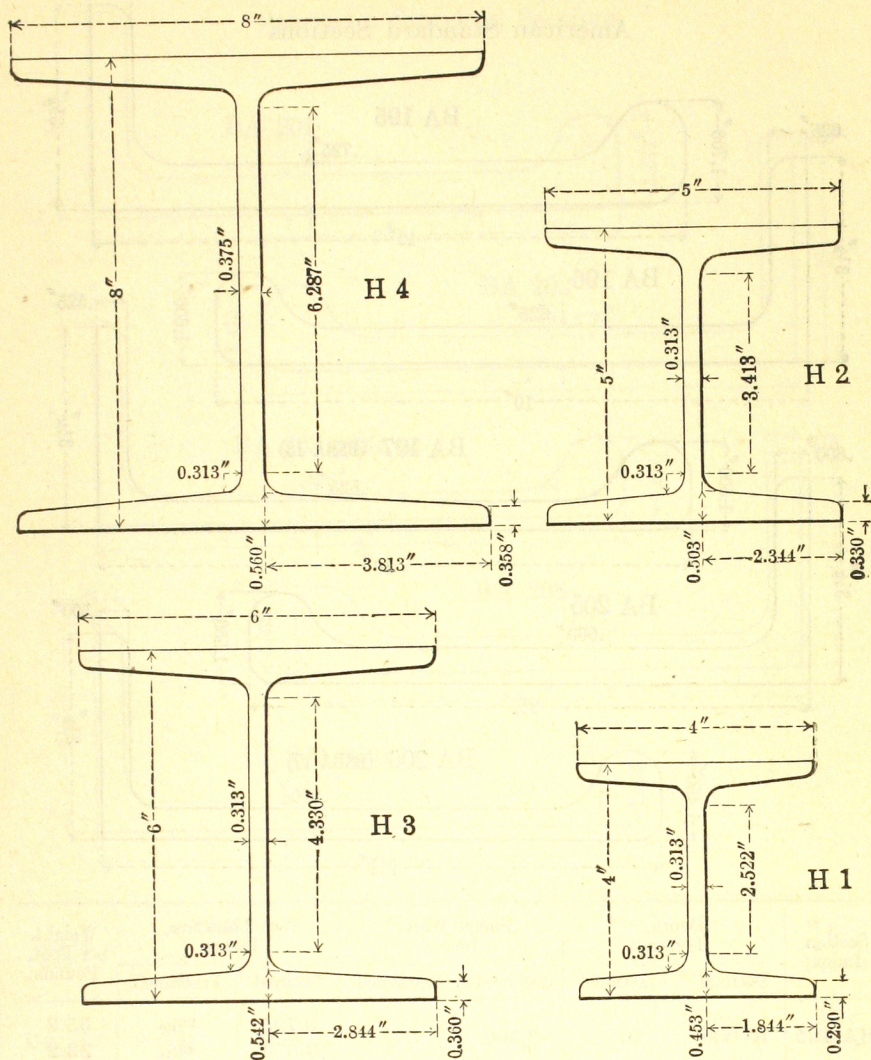
STRUCTURAL BEAMS—Concluded



Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
B 14 (Old No. B 19)	6	17.25	3.565	$3\frac{9}{16}$	0.465	$15\frac{3}{32}$
		14.75	3.443	$3\frac{7}{16}$	0.343	$11\frac{1}{32}$
		12.5	3.330	$3\frac{21}{64}$	0.230	$15\frac{5}{64}$
B 15 (Old No. B 21)	5	14.75	3.284	$3\frac{9}{32}$	0.494	$1\frac{1}{2}$
		12.25	3.137	$3\frac{9}{64}$	0.347	$11\frac{1}{32}$
		10.0	3.000	3	0.210	$13\frac{3}{64}$
B 16 (Old No. B 23)	4	10.5	2.870	$2\frac{7}{8}$	0.400	$13\frac{3}{32}$
		9.5	2.796	$2\frac{51}{64}$	0.326	$21\frac{1}{64}$
		8.5	2.723	$2\frac{23}{32}$	0.253	$\frac{1}{4}$
		7.7	2.660	$2\frac{21}{32}$	0.190	$3\frac{1}{16}$
B 17 (Old No. B 77)	3	7.5	2.509	$2\frac{33}{64}$	0.349	$11\frac{1}{32}$
		6.5	2.411	$2\frac{13}{32}$	0.251	$\frac{1}{4}$
		5.7	2.330	$2\frac{21}{64}$	0.170	$11\frac{1}{64}$

BEAMS

H-BEAMS

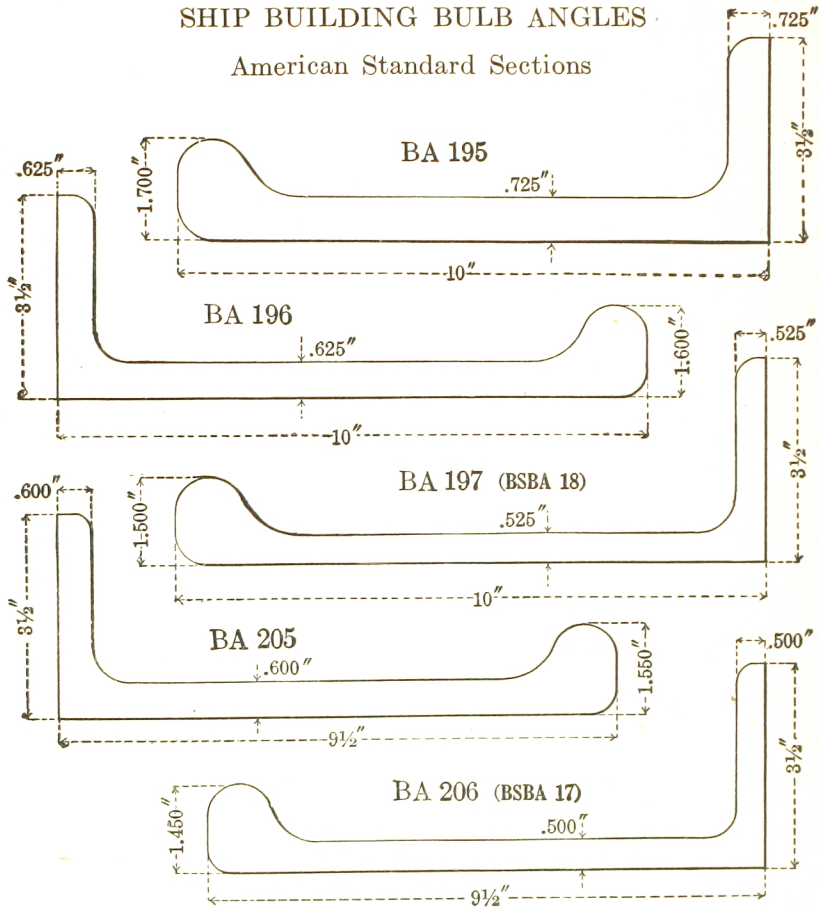


Section Index	Depth of Beam, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
H 4	8	34.3	8.000	8	0.375	$\frac{3}{8}$
H 3	6	24.1	6.000	6	0.313	$\frac{5}{16}$
H 2	5	18.9	5.000	5	0.313	$\frac{5}{16}$
H 1	4	13.8	4.000	4	0.313	$\frac{5}{16}$

H-Beams shown on this sheet are particularly adapted for use in inside mine timbering. Full information as to their properties and uses is given in separate pamphlets entitled "Steel Mine Timbers."

CARNEGIE STEEL COMPANY

SHIP BUILDING BULB ANGLES American Standard Sections

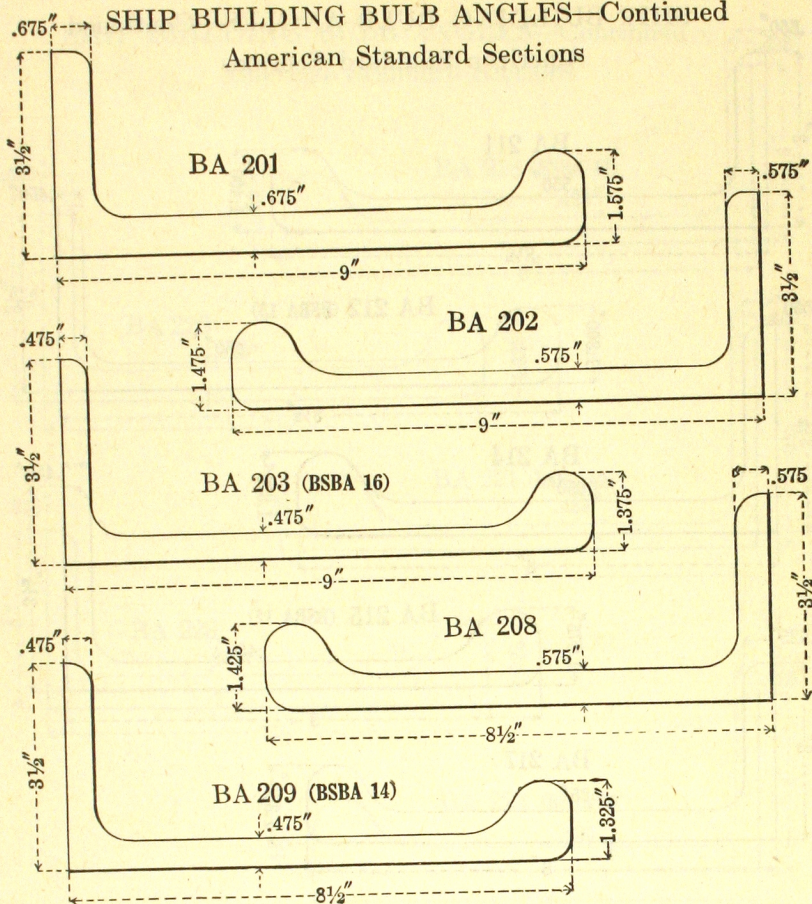


Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 195	10.000	10	3.500	3 1/2	.725	23/32	35.2
					.675	43/64	33.2
BA 196	10.000	10	3.500	3 1/2	.625	5/8	31.1
					.575	37/64	29.1
BA 197 (BSBA 18)	10.000	10	3.500	3 1/2	.525	17/32	26.9
					.475	15/32	24.9
BA 205	9.500	9 1/2	3.500	3 1/2	.600	19/32	28.8
					.550	35/64	26.9
BA 206 (BSBA 17)	9.500	9 1/2	3.500	3 1/2	.500	1/2	24.7
					.450	29/64	22.8

Dimensions of British Standard Sections are indicated in **bold type**.

BULB ANGLES

SHIP BUILDING BULB ANGLES—Continued American Standard Sections

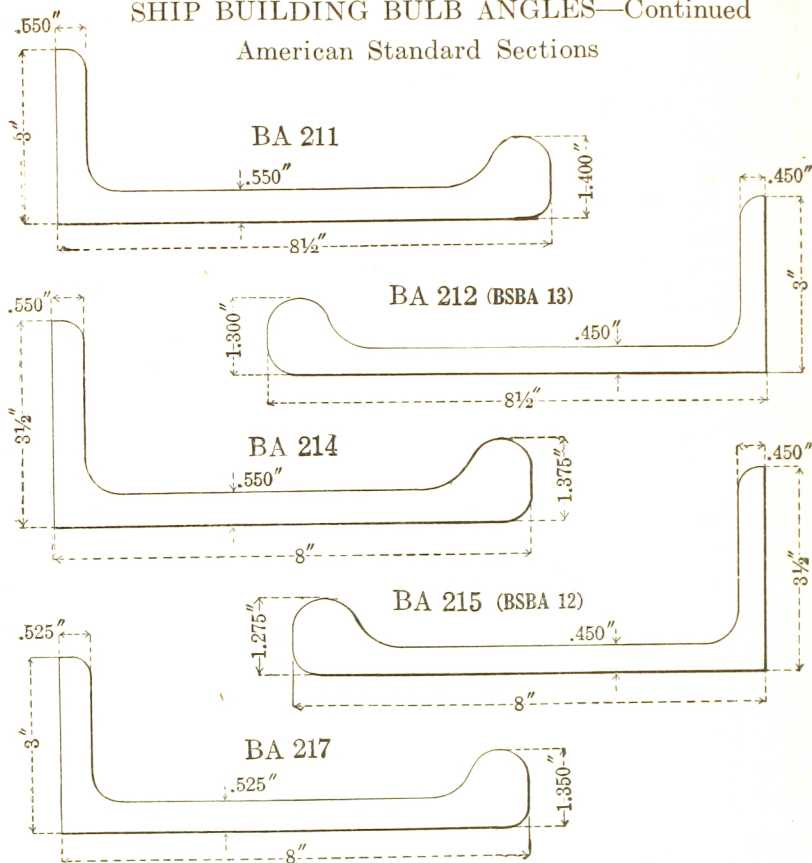


Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 201	9.000	9	3.500	3 1/2	0.675	43/64	30.4
					0.625	5/8	28.6
BA 202	9.000	9	3.500	3 1/2	0.575	37/64	26.6
					0.525	17/32	24.8
BA 203 (BSBA 16)	9.000	9	3.500	3 1/2	0.475	15/32	22.7
					0.425	27/64	20.9
BA 208	8.500	8 1/2	3.500	3 1/2	0.575	37/64	25.3
					0.525	17/32	23.5
BA 209 (BSBA 14)	8.500	8 1/2	3.500	3 1/2	0.475	15/32	21.6
					0.425	27/64	19.8

Dimensions of British Standard Sections are indicated in **bold type**.

CARNEGIE STEEL COMPANY

SHIP BUILDING BULB ANGLES—Continued American Standard Sections

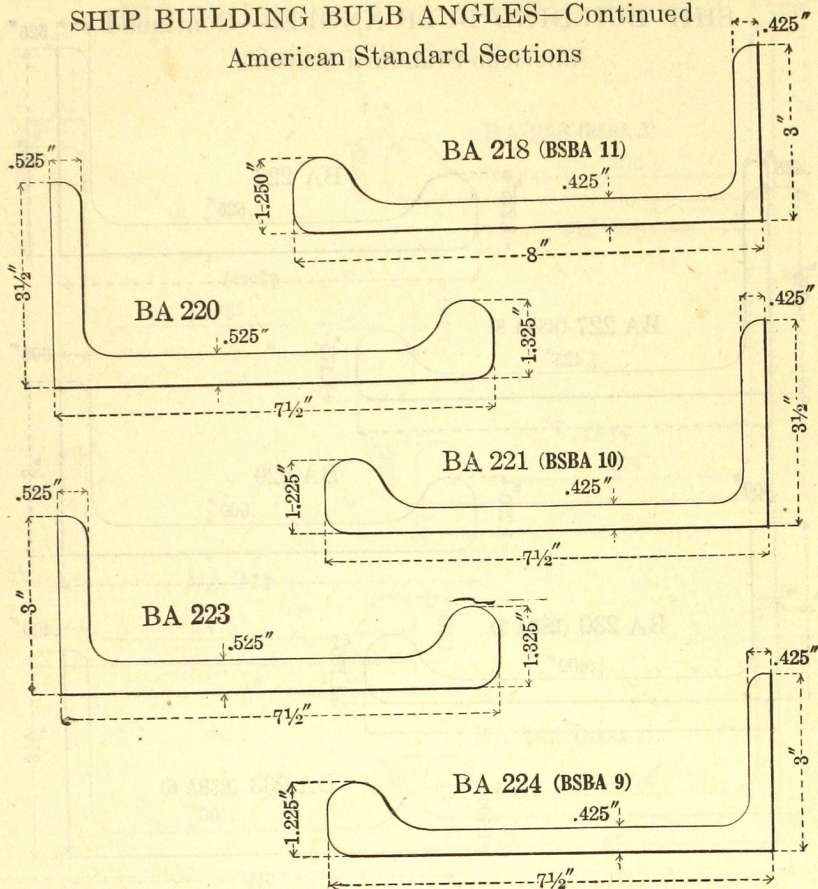


Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 211	8.500	8 1/2	3.000	3	0.550	35/64	23.4
					0.500	1/2	21.7
BA 212 (BSBA 13)	8.500	8 1/2	3.000	3	0.450	29/64	19.8
					0.400	13/32	18.1
BA 214	8.000	8	3.500	3 1/2	0.550	35/64	23.2
					0.500	1/2	21.6
BA 215 (BSBA 12)	8.000	8	3.500	3 1/2	0.450	29/64	19.6
					0.400	13/32	18.0
BA 217	8.000	8	3.000	3	0.575	37/64	23.1
					0.525	17/32	21.4

Dimensions of British Standard Sections are indicated in **bold type**.

BULB ANGLES

SHIP BUILDING BULB ANGLES—Continued American Standard Sections

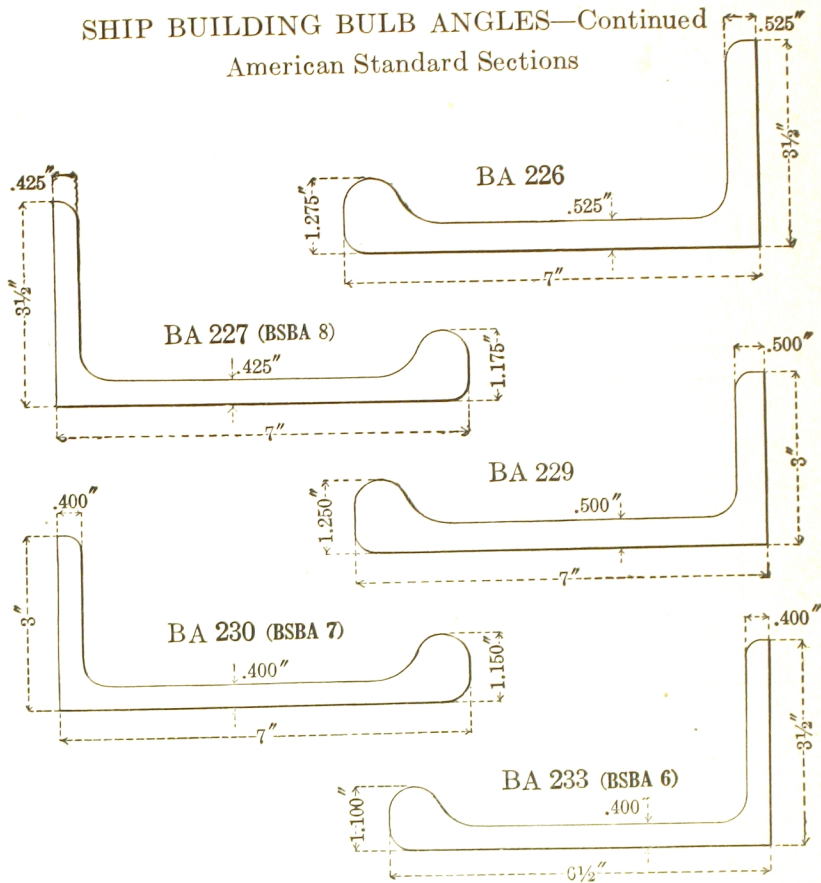


Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 218 (BSBA 11)	8.000	8	3.000	3	0.475	$\frac{15}{32}$	19.6
					0.425	$\frac{27}{64}$	18.0
BA 220	7.500	$7\frac{1}{2}$	3.500	$3\frac{1}{2}$	0.575	$\frac{37}{64}$	22.8
					0.525	$\frac{17}{32}$	21.2
BA 221 (BSBA 10)	7.500	$7\frac{1}{2}$	3.500	$3\frac{1}{2}$	0.475	$\frac{15}{32}$	19.4
					0.425	$\frac{27}{64}$	17.8
BA 223	7.500	$7\frac{1}{2}$	3.000	3	0.525	$\frac{17}{32}$	20.3
					0.475	$\frac{15}{32}$	18.8
BA 224 (BSBA 9)	7.500	$7\frac{1}{2}$	3.000	3	0.425	$\frac{27}{64}$	17.1
					0.375	$\frac{3}{8}$	15.6

Dimensions of British Standard Sections are indicated in **bold type**.

CARNEGIE STEEL COMPANY

SHIP BUILDING BULB ANGLES—Continued American Standard Sections

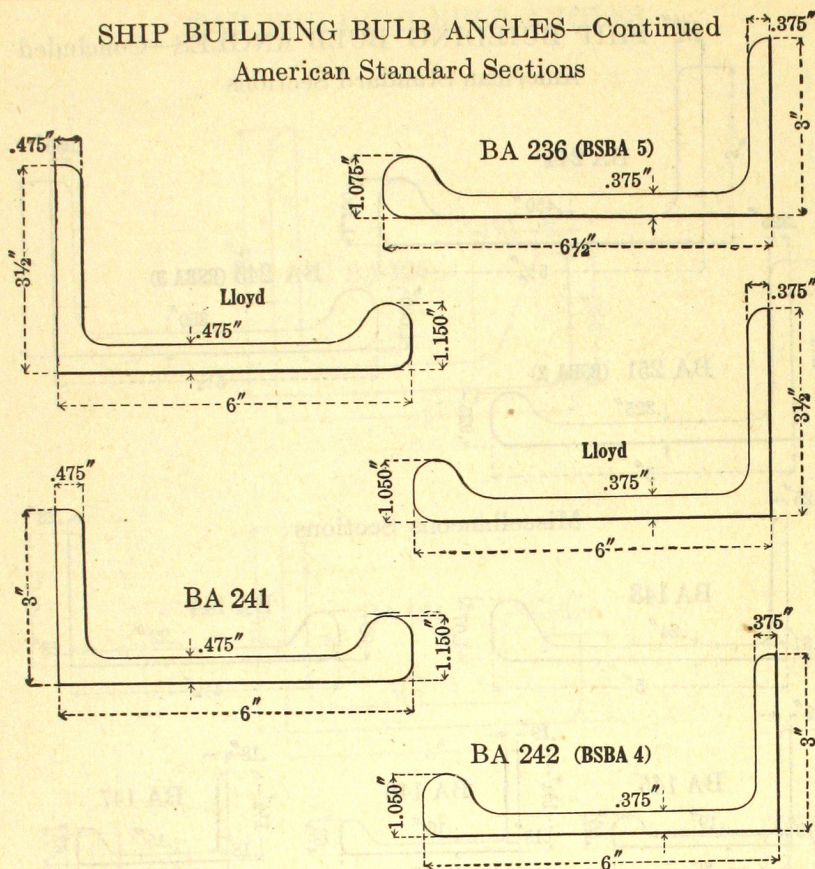


Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 226	7.000	7	3.500	3 1/2	0.525	17/32	20.0
					0.475	15/32	18.6
BA 227 (BSBA 8)	7.000	7	3.500	3 1/2	0.425	27/64	16.8
					0.375	3/8	15.3
BA 229	7.000	7	3.000	3	0.500	1/2	18.4
					0.450	29/64	16.9
BA 230 (BSBA 7)	7.000	7	3.000	3	0.400	13/32	15.3
					0.350	11/32	13.9
BA 233 (BSBA 6)	6.500	6 1/2	3.500	3 1/2	0.400	13/32	15.0
					0.350	11/32	13.6

Dimensions of British Standard Sections are indicated in **bold type**.

BULB ANGLES

SHIP BUILDING BULB ANGLES—Continued American Standard Sections



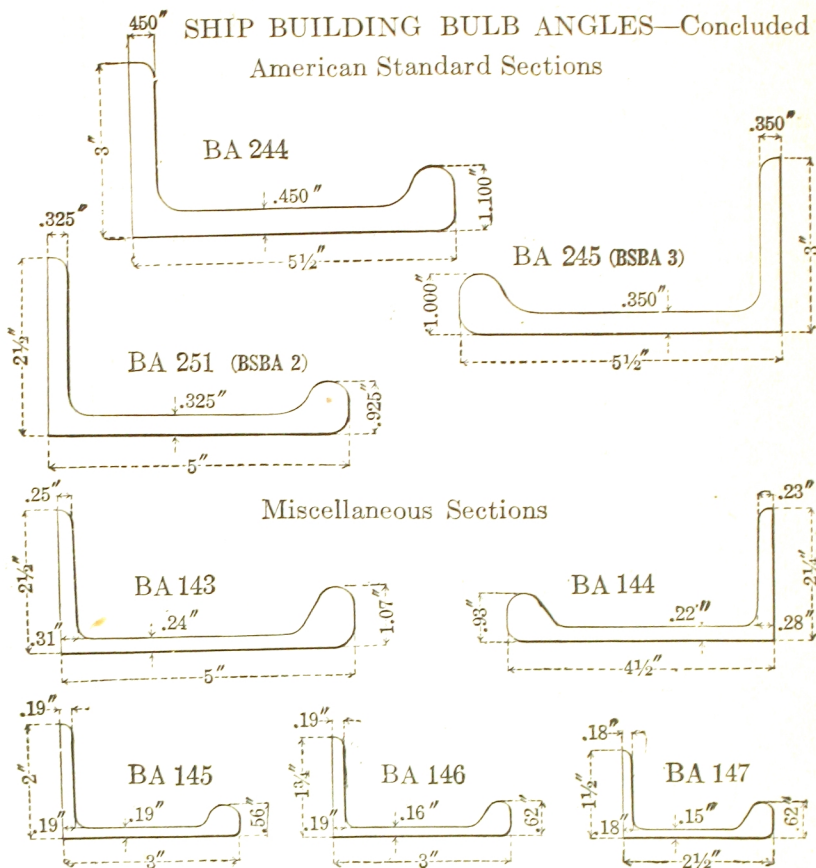
Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 236 (BSBA 5)	6.500	6½	3.000	3	0.425	27/64	15.0
					0.375	3/8	13.6
					0.350	11/32	12.9
† Lloyd	6.000	6	3.500	3½	0.475	15/32	16.4
					0.425	27/64	14.8
† Lloyd	6.000	6	3.500	3½	0.375	3/8	13.4
					0.350	11/32	12.8
BA 241	6.000	6	3.000	3	0.525	17/32	16.8
					0.475	15/32	15.6
BA 242 (BSBA 4)	6.000	6	3.000	3	0.425	27/64	14.1
					0.375	3/8	12.8
					0.350	11/32	12.2

†Rolled by Pencoyd Iron Works (60A).

Dimensions of British Standard Sections are indicated in **bold type**.

CARNEGIE STEEL COMPANY

SHIP BUILDING BULB ANGLES—Concluded American Standard Sections



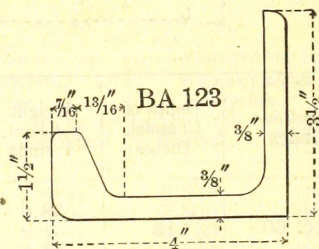
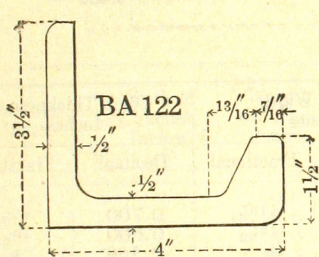
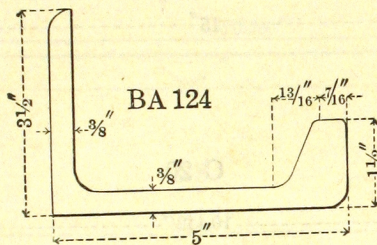
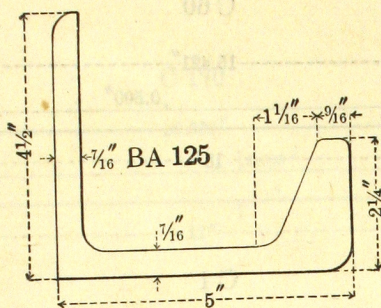
Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 244	5.500	5½	3.000	3	0.500	½	15.1
					0.450	29/64	13.9
BA 245 (BSBA 3)	5.500	5½	3.000	3	0.400	13/32	12.5
					0.350	11/32	11.3
					0.325	21/64	10.7
					0.375	3/8	10.4
BA 251 (BSBA 2)	5.000	5	2.500	2½	0.325	21/64	9.3
					0.300	19/64	8.8
*BA 143	5.000	5	2.500	2½	0.240	¼	8.3
*BA 144	4.500	4½	2.250	2¼	0.220	7/32	6.7
*BA 145	3.000	3	2.000	2	0.190	3/16	3.60
*BA 146	3.000	3	1.750	1¾	0.160	5/32	3.25
*BA 147	2.500	2½	1.500	1½	0.150	5/32	2.66

*Furnished only by special arrangement.

Dimensions of British Standard Sections are indicated in **bold type**.

BULB ANGLES

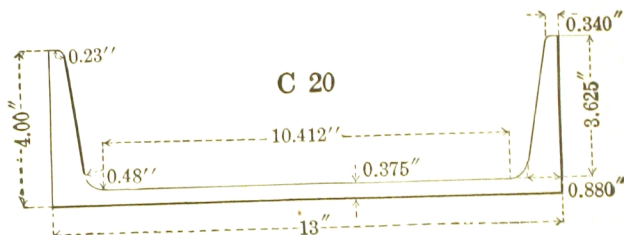
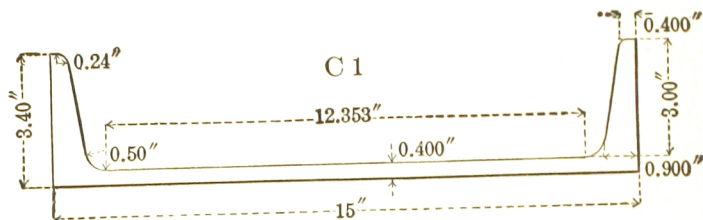
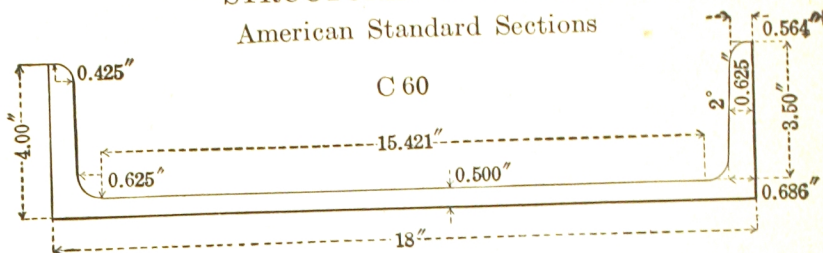
CAR BUILDING BULB ANGLES



Section Index	Depth, Inches		Flange Width, Inches		Web Thickness, Inches		Weight per Foot, Pounds
	Decimal	Fractional	Decimal	Fractional	Decimal	Fractional	
BA 125	5.000	5	4.500	4 1/2	0.438	7/16	19.3
BA 124	5.000	5	3.500	3 1/2	0.375	3/8	13.2
BA 122	4.000	4	3.500	3 1/2	0.500	1/2	14.3
BA 123	4.000	4	3.500	3 1/2	0.375	3/8	11.9

CARNEGIE STEEL COMPANY

STRUCTURAL CHANNELS American Standard Sections

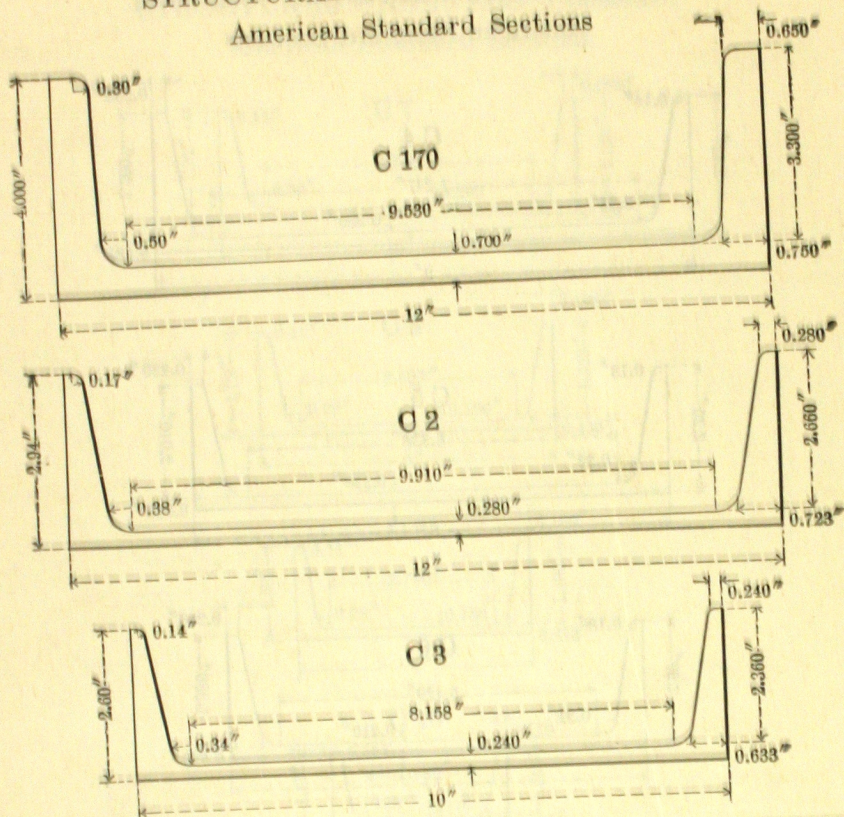


Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
†C 60	18	58.0 *	4.200	4 13/64	0.700	45/64
		51.9	4.100	4 3/32	0.600	19/32
		45.8	4.000	4	0.500	1/2
		42.7	3.950	3 61/64	0.450	29/64
C 1	15	55.0	3.814	3 13/16	0.814	13 1/16
		50.0	3.716	3 23/32	0.716	23 3/32
		45.0	3.618	3 5/8	0.618	5/8
		40.0	3.520	3 33/64	0.520	33/64
		35.0	3.422	3 27/64	0.422	27/64
		33.9	3.400	3 13/32	0.400	13/32
†C 20	13	50.0	4.412	4 13/32	0.787	25 3/32
		45.0	4.298	4 19/64	0.673	43/64
		40.0	4.185	4 3/16	0.560	9/16
		37.0	4.117	4 7/64	0.492	31/64
		35.0	4.072	4 5/64	0.447	29/64
		31.8	4.000	4	0.375	3/8

†C 60 is a Ship Building Channel (not an American Standard.) †C 20 is a Car Building Channel.

CHANNELS

STRUCTURAL CHANNELS—Continued American Standard Sections

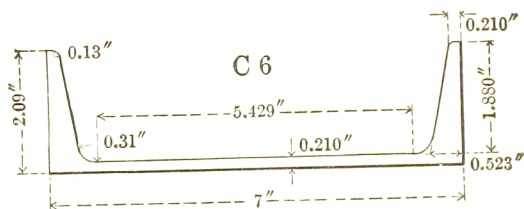
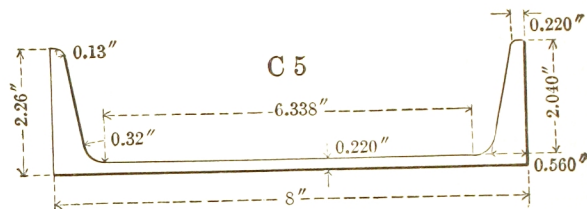
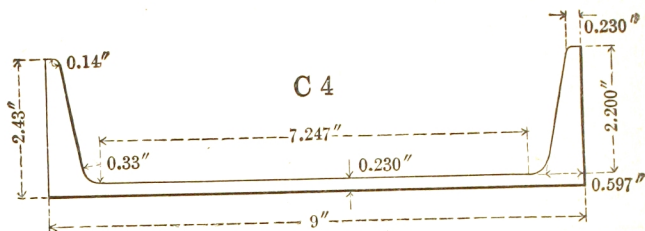


Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
†C 170	12	50.0	4.135	4 ⁹ / ₆₄	0.835	53 ¹ / ₆₄
		48.6	4.100	4 ³ / ₃₂	0.800	51 ¹ / ₆₄
		46.6	4.050	4 ³ / ₆₄	0.750	4 ⁹ / ₁₆
		44.5	4.000	4	0.700	45 ¹ / ₆₄
		40.0	3.890	3 ⁵⁷ / ₆₄	0.590	19 ¹ / ₃₂
		35.0	3.767	3 ⁴⁹ / ₆₄	0.467	15 ⁹ / ₃₂
C 2	12	40.0	3.415	3 ²⁷ / ₆₄	0.755	4 ⁹ / ₁₆
		35.0	3.292	3 ¹⁹ / ₆₄	0.632	5 ¹ / ₈
		30.0	3.170	3 ¹¹ / ₆₄	0.510	33 ¹ / ₆₄
		25.0	3.047	3 ³ / ₆₄	0.387	25 ¹ / ₆₄
		20.7	2.940	2 ¹⁵ / ₁₆	0.280	9 ¹ / ₃₂
C 3	10	35.0	3.180	3 ⁹ / ₁₆	0.820	13 ¹ / ₁₆
		30.0	3.033	3 ¹ / ₃₂	0.673	43 ¹ / ₆₄
		25.0	2.886	2 ⁵⁷ / ₆₄	0.526	17 ¹ / ₃₂
		20.0	2.739	2 ⁴⁷ / ₆₄	0.379	3 ¹ / ₈
		15.3	2.600	2 ¹⁹ / ₃₂	0.240	15 ¹ / ₆₄

†C 170 is a Car Building Channel (not an American Standard.)

CARNEGIE STEEL COMPANY

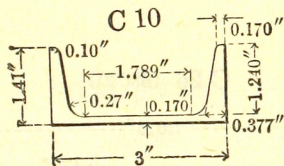
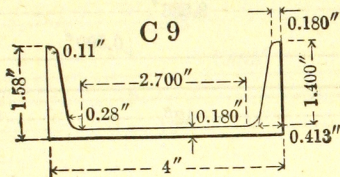
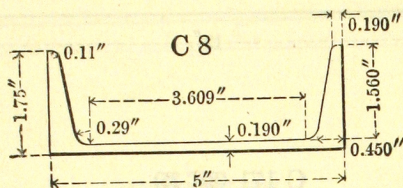
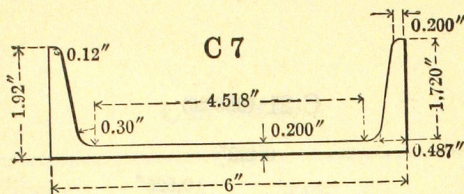
STRUCTURAL CHANNELS—Continued American Standard Sections



Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 4	9	25.0	2.812	$2\frac{13}{16}$	0.612	$\frac{39}{64}$
		20.0	2.648	$2\frac{1}{64}$	0.448	$\frac{29}{64}$
		15.0	2.485	$2\frac{3}{64}$	0.285	$\frac{9}{32}$
		13.4	2.430	$2\frac{7}{16}$	0.230	$\frac{15}{64}$
C 5	8	21.25	2.619	$2\frac{5}{8}$	0.579	$\frac{37}{64}$
		18.75	2.527	$2\frac{17}{32}$	0.487	$\frac{31}{64}$
		16.25	2.435	$2\frac{7}{16}$	0.395	$\frac{25}{64}$
		13.75	2.343	$2\frac{11}{32}$	0.303	$\frac{19}{64}$
		11.5	2.260	$2\frac{17}{64}$	0.220	$\frac{7}{32}$
C 6	7	19.75	2.509	$2\frac{33}{64}$	0.629	$\frac{5}{8}$
		17.25	2.404	$2\frac{13}{32}$	0.524	$\frac{17}{32}$
		14.75	2.299	$2\frac{19}{64}$	0.419	$\frac{27}{64}$
		12.25	2.194	$2\frac{3}{16}$	0.314	$\frac{5}{16}$
		9.8	2.090	$2\frac{9}{32}$	0.210	$\frac{13}{64}$

CHANNELS

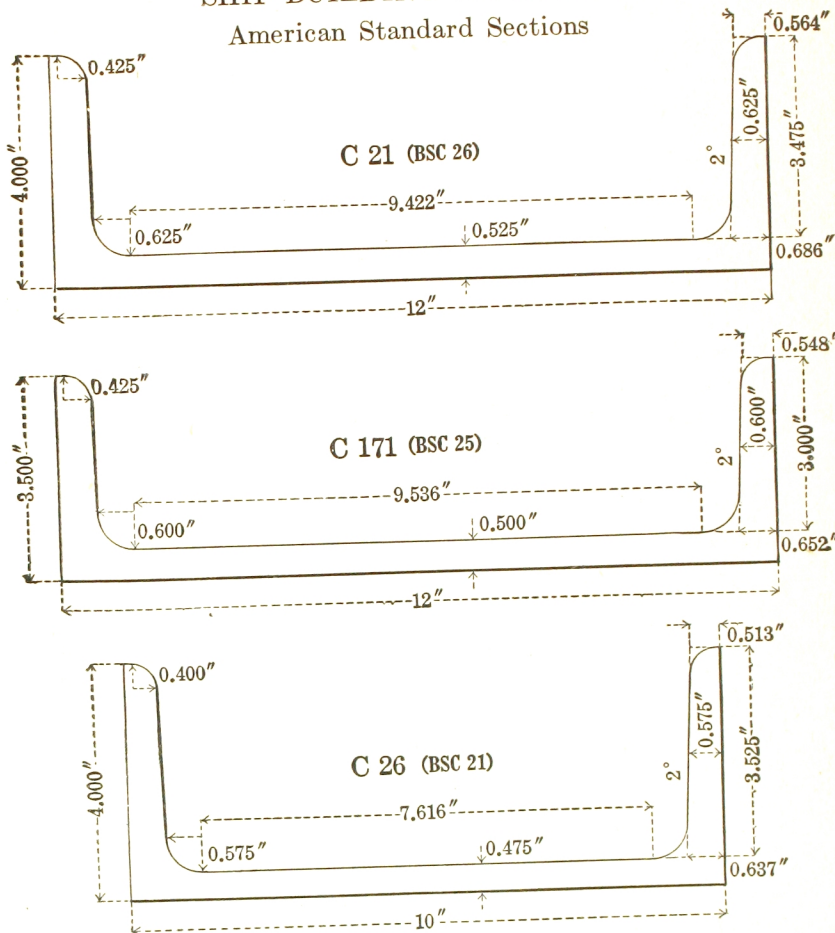
STRUCTURAL CHANNELS—Concluded American Standard Sections



Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 7	6	15.5	2.279	$2\frac{9}{32}$	0.559	$\frac{9}{16}$
		13.0	2.157	$2\frac{5}{32}$	0.437	$\frac{7}{16}$
		10.5	2.034	$2\frac{1}{32}$	0.314	$\frac{5}{16}$
		8.2	1.920	$1\frac{59}{64}$	0.200	$\frac{13}{64}$
C 8	5	11.5	2.032	$2\frac{1}{32}$	0.472	$1\frac{5}{32}$
		9.0	1.885	$1\frac{57}{64}$	0.325	$2\frac{1}{64}$
		6.7	1.750	$1\frac{3}{4}$	0.190	$\frac{3}{16}$
C 9	4	7.25	1.720	$1\frac{23}{32}$	0.320	$\frac{5}{16}$
		6.25	1.647	$1\frac{41}{64}$	0.247	$\frac{1}{4}$
		5.4	1.580	$1\frac{37}{64}$	0.180	$\frac{3}{16}$
C 10 (Old No. C 72)	3	6.0	1.596	$1\frac{19}{32}$	0.356	$2\frac{3}{64}$
		5.0	1.498	$1\frac{1}{2}$	0.258	$\frac{1}{4}$
		4.1	1.410	$1\frac{13}{32}$	0.170	$\frac{11}{64}$

CARNEGIE STEEL COMPANY

SHIP BUILDING CHANNELS American Standard Sections

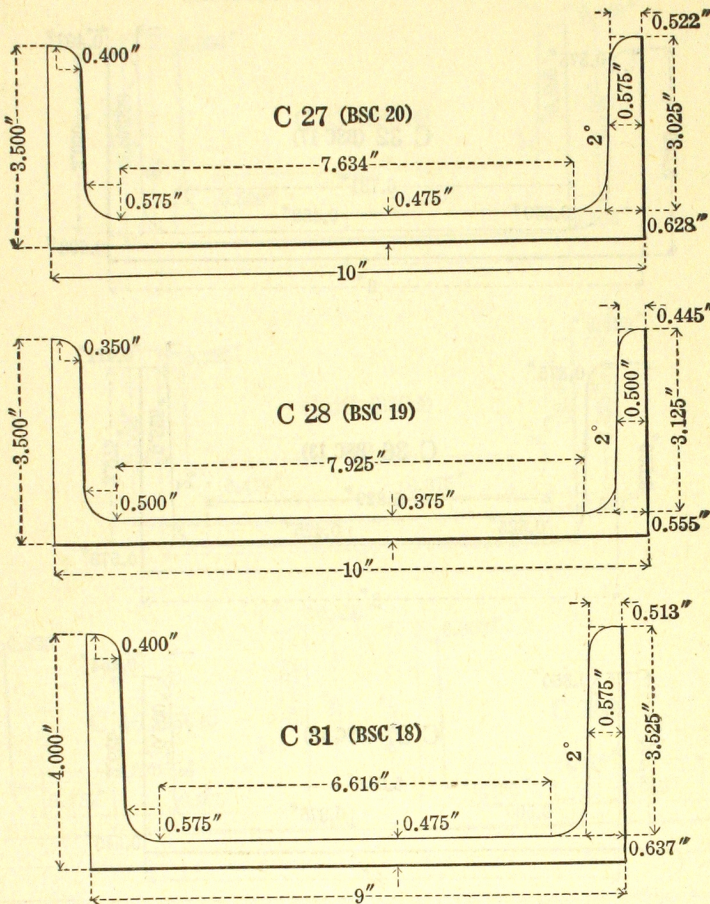


Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 21 (BSC 26)	12	44.7	4.200	41 ³ / ₆₄	0.725	23 ³ / ₃₂
		40.6	4.100	43 ³ / ₃₂	0.625	5 ⁵ / ₈
		36.5	4.000	4	0.525	17 ³ / ₃₂
		34.5	3.950	36 ¹ / ₆₄	0.475	15 ³ / ₃₂
C 171 (BSC 25)	12	41.1	3.700	34 ⁵ / ₆₄	0.700	45 ⁵ / ₆₄
		37.0	3.600	31 ⁹ / ₃₂	0.600	19 ³ / ₃₂
		32.9	3.500	31¹/₂	0.500	1¹/₂
		30.9	3.450	32 ⁹ / ₆₄	0.450	29 ³ / ₆₄
C 26 (BSC 21)	10	37.0	4.200	41 ³ / ₆₄	0.675	43 ³ / ₆₄
		33.6	4.100	43 ³ / ₃₂	0.575	37 ³ / ₆₄
		30.2	4.000	4	0.475	15 ³ / ₃₂
		28.5	3.950	36 ¹ / ₆₄	0.425	27 ³ / ₆₄

Dimensions and properties of the British Standard Sections are indicated in bold type.

CHANNELS

SHIP BUILDING CHANNELS—Continued American Standard Sections

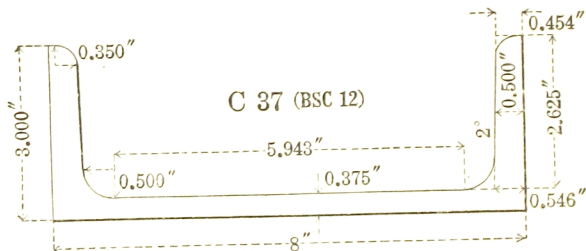
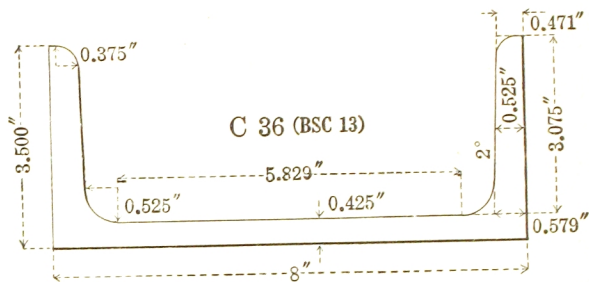
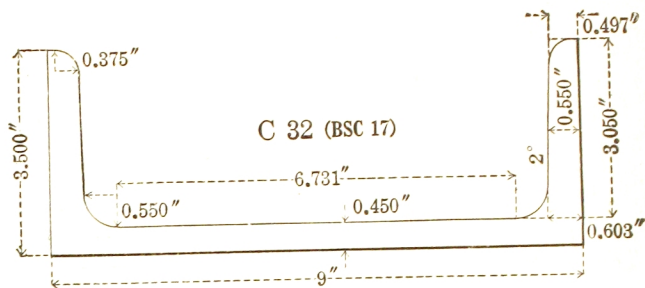


Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 27 (BSC 20)	10	35.1	3.700	$3\frac{45}{64}$	0.675	$\frac{43}{64}$
		31.7	3.600	$3\frac{19}{32}$	0.575	$\frac{37}{64}$
		28.3	3.500	$3\frac{1}{2}$	0.475	$\frac{15}{32}$
		26.6	3.450	$3\frac{29}{64}$	0.425	$\frac{27}{64}$
		24.9	3.400	$3\frac{13}{32}$	0.375	$\frac{3}{8}$
C 28 (BSC 19)	10	25.3	3.550	$3\frac{35}{64}$	0.425	$\frac{27}{64}$
		23.6	3.500	$3\frac{1}{2}$	0.375	$\frac{3}{8}$
		21.9	3.450	$3\frac{29}{64}$	0.325	$\frac{21}{64}$
C 31 (BSC 18)	9	34.7	4.200	$4\frac{13}{64}$	0.675	$\frac{43}{64}$
		31.7	4.100	$4\frac{3}{32}$	0.575	$\frac{37}{64}$
		28.6	4.000	4	0.475	$\frac{15}{32}$
		27.1	3.950	$3\frac{61}{64}$	0.425	$\frac{27}{64}$

Dimensions and properties of the British Standard Sections are indicated in **bold type**.

CARNEGIE STEEL COMPANY

SHIP BUILDING CHANNELS—Continued American Standard Sections

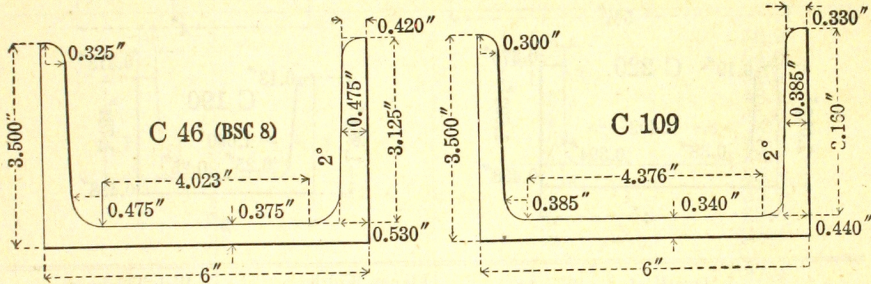
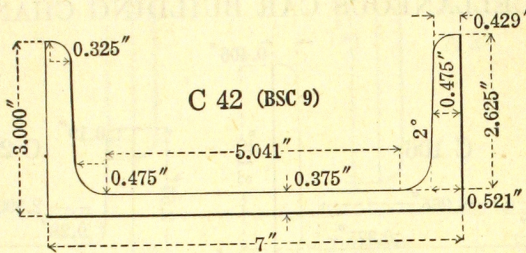
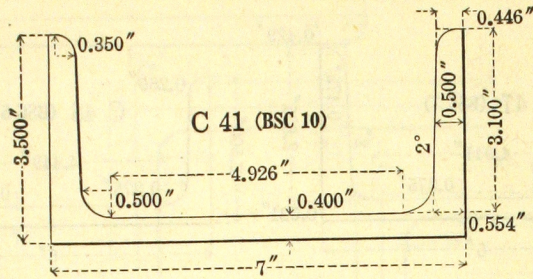


Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 32 (BSC 17)	9	31.6	3.700	$3\frac{45}{64}$	0.650	$2\frac{1}{32}$
		28.5	3.600	$3\frac{19}{32}$	0.550	$\frac{35}{64}$
		25.4	3.500	$3\frac{1}{2}$	0.450	$\frac{29}{64}$
		23.9	3.450	$3\frac{29}{64}$	0.400	$\frac{13}{32}$
C 36 (BSC 13)	8	28.2	3.700	$3\frac{45}{64}$	0.625	$\frac{5}{8}$
		25.5	3.600	$3\frac{19}{32}$	0.525	$\frac{17}{32}$
		22.8	3.500	$3\frac{1}{2}$	0.425	$\frac{27}{64}$
		21.4	3.450	$3\frac{29}{64}$	0.375	$\frac{3}{8}$
C 37 (BSC 12)	8	25.5	3.225	$3\frac{7}{32}$	0.600	$\frac{19}{32}$
		22.7	3.125	$3\frac{1}{8}$	0.500	$\frac{1}{2}$
		20.0	3.025	$3\frac{1}{32}$	0.400	$\frac{13}{32}$
		19.3	3.000	3	0.375	$\frac{3}{8}$
		18.7	2.975	$2\frac{31}{32}$	0.350	$\frac{11}{32}$

Dimensions and properties of the British Standard Sections are indicated in **bold type**.

CHANNELS

SHIP BUILDING CHANNELS—Continued American Standard Sections

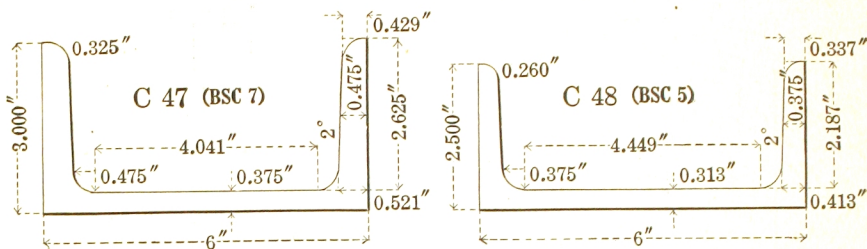


Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 41 (BSC 10)	7	25.0	3.700	$3\frac{45}{64}$	0.600	$1\frac{9}{32}$
		22.7	3.600	$3\frac{19}{32}$	0.500	$\frac{1}{2}$
		20.3	3.500	$3\frac{1}{2}$	0.400	$1\frac{3}{32}$
		19.1	3.450	$3\frac{29}{64}$	0.350	$1\frac{1}{32}$
C 42 (BSC 9)	7	20.0	3.100	$3\frac{3}{32}$	0.475	$1\frac{5}{32}$
		17.6	3.000	3	0.375	$\frac{3}{8}$
		16.4	2.950	$2\frac{61}{64}$	0.325	$2\frac{1}{64}$
C 46 (BSC 8)	6	22.0	3.700	$3\frac{45}{64}$	0.575	$3\frac{7}{64}$
		20.0	3.600	$3\frac{19}{32}$	0.475	$1\frac{5}{32}$
		18.0	3.500	$3\frac{1}{2}$	0.375	$\frac{3}{8}$
		16.9	3.450	$3\frac{29}{64}$	0.325	$2\frac{1}{64}$
C 109	6	15.3	3.500	$3\frac{1}{2}$	0.340	$1\frac{1}{32}$

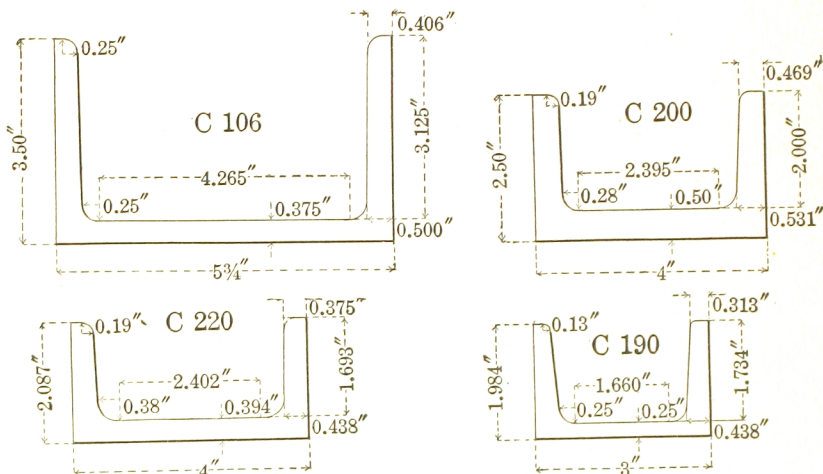
Dimensions and properties of the British Standard Sections are indicated in **bold type**.

CARNEGIE STEEL COMPANY

SHIP BUILDING CHANNELS—Concluded American Standard Sections



MISCELLANEOUS CAR BUILDING CHANNELS



Section Index	Depth of Channel, Inches	Weight per Foot, Pounds	Flange Width, Inches		Web Thickness, Inches	
			Decimal	Fractional	Decimal	Fractional
C 47 (BSC 7)	6	16.3 15.1	3.000 2.938	3 2 15/16	0.375 0.313	3/8 5/16
C 48 (BSC 5)	6	13.3 12.0	2.563 2.500	2 9/16 2 1/2	0.375 0.313	3/8 5/16

Dimensions of British Standard Sections are indicated in **bold type**.

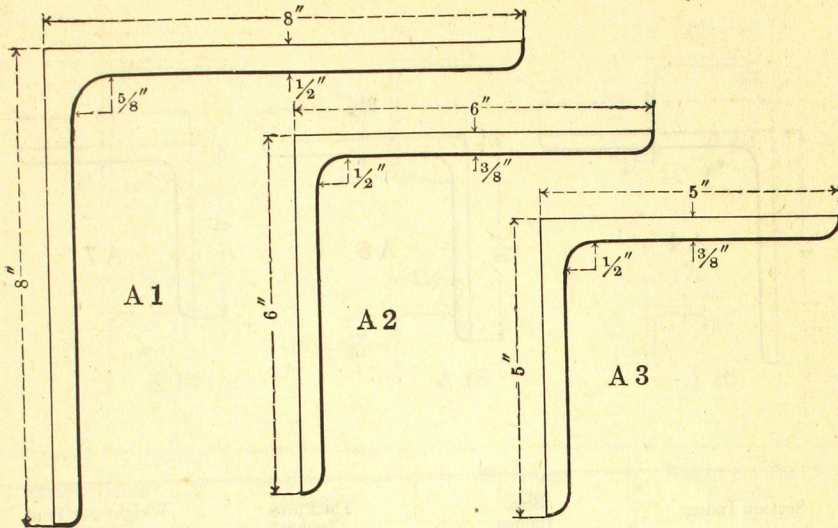
MISCELLANEOUS CAR BUILDING CHANNELS

*C 106	5 3/4	17.0	3.500	3 1/2	0.375	3/8
*C 200	4	13.8	2.500	2 1/2	0.500	1/2
*C 220	4	10.1	2.087	2 3/32	0.394	25/64
*C 190	3	7.1	1.984	1 63/64	0.250	1/4

*Furnished only by special arrangement.

ANGLES

EQUAL ANGLES

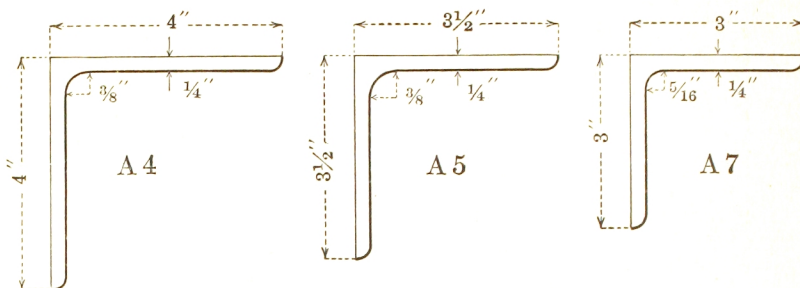


Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 1	8 x 8	$1\frac{1}{8}$	56.9
		$1\frac{1}{16}$	54.0
		1	51.0
		$15\frac{1}{16}$	48.1
		$\frac{7}{8}$	45.0
		$13\frac{1}{16}$	42.0
		$\frac{3}{4}$	38.9
		$11\frac{1}{16}$	35.8
		$\frac{5}{8}$	32.7
		$\frac{9}{16}$	29.6
A 2	6 x 6	$\frac{1}{2}$	26.4
		1	37.4
		$15\frac{1}{16}$	35.3
		$\frac{7}{8}$	33.1
		$13\frac{1}{16}$	31.0
		$\frac{3}{4}$	28.7
		$11\frac{1}{16}$	26.5
		$\frac{5}{8}$	24.2
		$\frac{9}{16}$	21.9
		$\frac{1}{2}$	19.6
A 3	5 x 5	$\frac{7}{16}$	17.2
		$\frac{3}{8}$	14.9
		*1	30.6
		* $15\frac{1}{16}$	28.9
		* $\frac{7}{8}$	27.2
		* $13\frac{1}{16}$	25.4
		* $\frac{3}{4}$	23.6
		* $11\frac{1}{16}$	21.8
		* $\frac{5}{8}$	20.0
		* $\frac{9}{16}$	18.1
		* $\frac{1}{2}$	16.2
		* $\frac{7}{16}$	14.3
		* $\frac{3}{8}$	12.3

*Special, see page 4.

CARNEGIE STEEL COMPANY

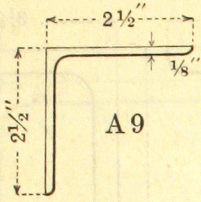
EQUAL ANGLES—Continued



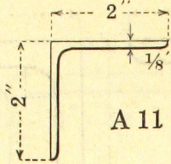
Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 4	4 x 4	*13/16	19.9
		3/4	18.5
		11/16	17.1
		5/8	15.7
		9/16	14.3
		1/2	12.8
		7/16	11.3
		3/8	9.8
		5/16	8.2
		* 1/4	6.6
A 5	3 1/2 x 3 1/2	*13/16	17.1
		* 3/4	16.0
		*11/16	14.8
		5/8	13.6
		9/16	12.4
		1/2	11.1
		7/16	9.8
		3/8	8.5
		5/16	7.2
		* 1/4	5.8
A 7	3 x 3	* 5/8	11.5
		* 9/16	10.4
		1/2	9.4
		7/16	8.3
		3/8	7.2
		5/16	6.1
		1/4	4.9

*Special, see page 4.

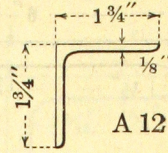
EQUAL ANGLES—Concluded



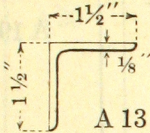
A 9



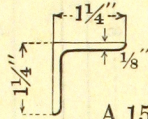
A 11



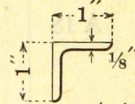
A 12



A 13



A 15



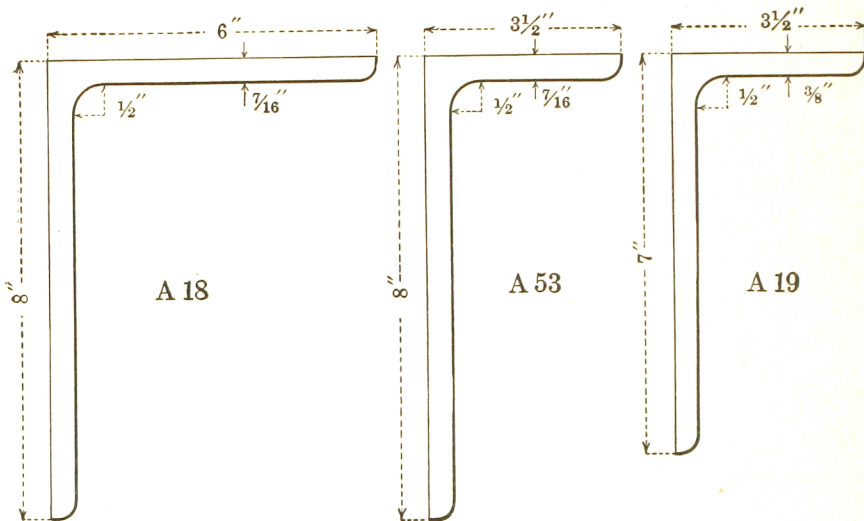
A 16

Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 9	$2\frac{1}{2} \times 2\frac{1}{2}$	* $\frac{1}{2}$	7.7
		$\frac{7}{16}$	6.8
		$\frac{3}{8}$	5.9
		$\frac{5}{16}$	5.0
		$\frac{1}{4}$	4.1
		$\frac{3}{16}$	3.07
A 11	2×2	* $\frac{1}{8}$	2.08
		* $\frac{7}{16}$	5.3
		$\frac{3}{8}$	4.7
		$\frac{5}{16}$	3.92
		$\frac{1}{4}$	3.19
		$\frac{3}{16}$	2.44
A 12	$1\frac{3}{4} \times 1\frac{3}{4}$	* $\frac{1}{8}$	1.65
		* $\frac{7}{16}$	4.6
		* $\frac{3}{8}$	3.99
		* $\frac{5}{16}$	3.39
		* $\frac{1}{4}$	2.77
		* $\frac{3}{16}$	2.12
A 13	$1\frac{1}{2} \times 1\frac{1}{2}$	* $\frac{1}{8}$	1.44
		* $\frac{3}{8}$	3.35
		$\frac{5}{16}$	2.86
		$\frac{1}{4}$	2.34
		$\frac{3}{16}$	1.80
		$\frac{1}{8}$	1.23
A 15	$1\frac{1}{4} \times 1\frac{1}{4}$	* $\frac{5}{16}$	2.33
		* $\frac{1}{4}$	1.92
		* $\frac{3}{16}$	1.48
		* $\frac{1}{8}$	1.01
A 16	1×1	* $\frac{1}{4}$	1.49
		* $\frac{3}{16}$	1.16
		* $\frac{1}{8}$	0.80

*Special, see page 4.

CARNEGIE STEEL COMPANY

UNEQUAL ANGLES

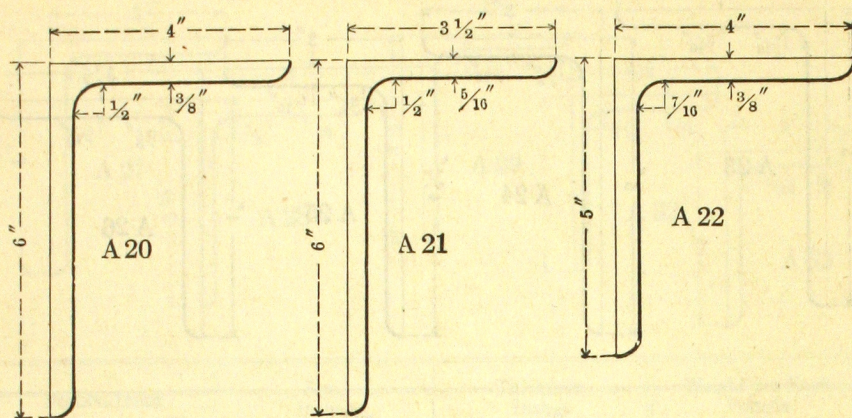


Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 18	8 x 6	*1	44.2
		* 15/16	41.7
		* 7/8	39.1
		* 13/16	36.5
		* 3/4	33.8
		* 11/16	31.2
		* 5/8	28.5
		* 9/16	25.7
		* 1/2	23.0
A 53	8 x 3 1/2	* 7/16	20.2
		*1	35.7
		* 15/16	33.7
		* 7/8	31.7
		* 13/16	29.6
		* 3/4	27.5
		* 11/16	25.3
		* 5/8	23.2
		* 9/16	21.0
A 19	7 x 3 1/2	* 1/2	18.7
		* 7/16	16.5
		*1	32.3
		* 15/16	30.5
		* 7/8	28.7
		* 13/16	26.8
		* 3/4	24.9
		* 11/16	23.0
		* 5/8	21.0
		* 9/16	19.1
		* 1/2	17.0
		* 7/16	15.0
		* 3/8	13.0

* Special, see page 4.

ANGLES

UNEQUAL ANGLES—Continued

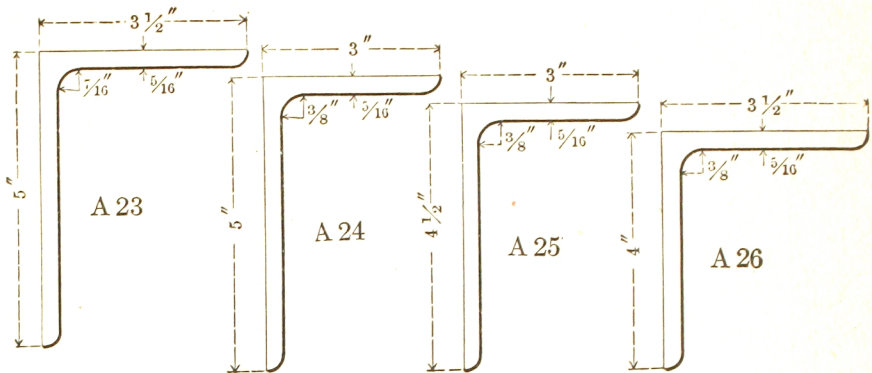


Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 20	6 x 4	*1	30.6
		* 15/16	28.9
		7/8	27.2
		13/16	25.4
		3/4	23.6
		11/16	21.8
		5/8	20.0
		9/16	18.1
		1/2	16.2
		7/16	14.3
		3/8	12.3
A 21	6 x 3 1/2	*1	28.9
		* 15/16	27.3
		7/8	25.7
		13/16	24.0
		3/4	22.4
		11/16	20.6
		5/8	18.9
		9/16	17.1
		1/2	15.3
		7/16	13.5
		3/8	11.7
A 22	5 x 4	* 5/16	9.8
		* 7/8	24.2
		* 13/16	22.7
		* 3/4	21.1
		* 11/16	19.5
		* 5/8	17.8
		* 9/16	16.2
		* 1/2	14.5
		* 7/16	12.8
		* 3/8	11.0

* Special, see page 4.

CARNEGIE STEEL COMPANY

UNEQUAL ANGLES—Continued

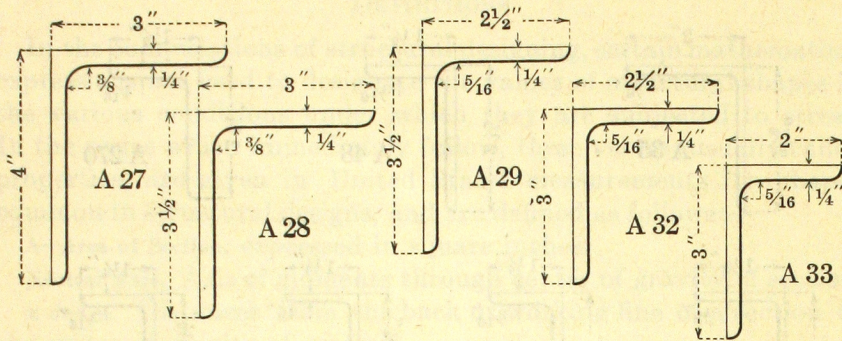


Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 23	5 x 3 1/2	* 7/8	22.7
		* 13/16	21.3
		* 3/4	19.8
		* 11/16	18.3
		* 5/8	16.8
		* 9/16	15.2
		* 1/2	13.6
		* 7/16	12.0
		* 3/8	10.4
		* 5/16	8.7
A 24	5 x 3	* 13/16	19.9
		* 3/4	18.5
		* 11/16	17.1
		* 5/8	15.7
		* 9/16	14.3
		* 1/2	12.8
		* 7/16	11.3
		* 3/8	9.8
		* 5/16	8.2
A 25	4 1/2 x 3	* 13/16	18.5
		* 3/4	17.3
		* 11/16	16.0
		* 5/8	14.7
		* 9/16	13.3
		* 1/2	11.9
		* 7/16	10.6
		* 3/8	9.1
		* 5/16	7.7
A 26	4 x 3 1/2	* 13/16	18.5
		* 3/4	17.3
		* 11/16	16.0
		* 5/8	14.7
		* 9/16	13.3
		* 1/2	11.9
		* 7/16	10.6
		* 3/8	9.1
		* 5/16	7.7

* Special, see page 4.

ANGLES

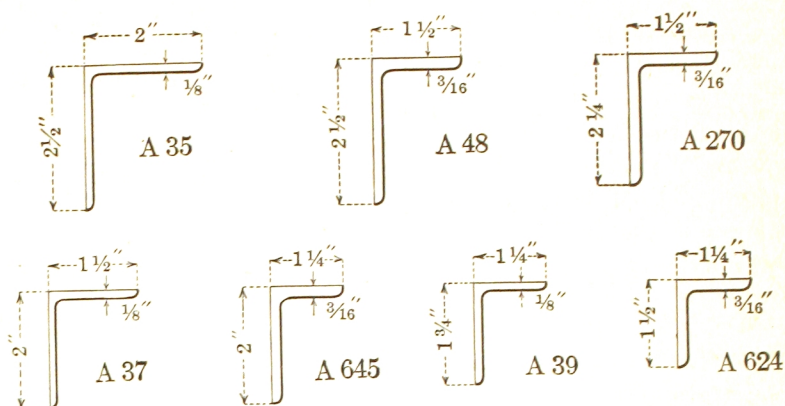
UNEQUAL ANGLES—Continued



Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 27	4 x 3	*13/16	17.1
		*3/4	16.0
		*11/16	14.8
		5/8	13.6
		9/16	12.4
		1/2	11.1
		7/16	9.8
		3/8	8.5
		5/16	7.2
A 28	3 1/2 x 3	*1/4	5.8
		*13/16	15.8
		*3/4	14.7
		*11/16	13.6
		*5/8	12.5
		9/16	11.4
		1/2	10.2
		7/16	9.1
		3/8	7.9
A 29	3 1/2 x 2 1/2	5/16	6.6
		*1/4	5.4
		*11/16	12.5
		*5/8	11.5
		*9/16	10.4
		1/2	9.4
		7/16	8.3
		3/8	7.2
		5/16	6.1
A 32	3 x 2 1/2	1/4	4.9
		*9/16	9.5
		*1/2	8.5
		7/16	7.6
		3/8	6.6
		5/16	5.6
		1/4	4.5
A 33	3 x 2	*1/2	7.7
		*7/16	6.8
		*3/8	5.9
		*5/16	5.0
		*1/4	4.1

*Special, see page 4.

UNEQUAL ANGLES—Concluded



Section Index	Size, Inches	Thickness, Inches	Weight per Foot, Pounds
A 35	$2\frac{1}{2} \times 2$	* $\frac{1}{2}$	6.8
		* $\frac{7}{16}$	6.1
		$\frac{3}{8}$	5.3
		$\frac{5}{16}$	4.5
		$\frac{1}{4}$	3.62
		$\frac{3}{16}$	2.75
A 48	$2\frac{1}{2} \times 1\frac{1}{2}$	* $\frac{1}{8}$	1.86
		* $\frac{5}{16}$	3.92
		* $\frac{1}{4}$	3.19
		* $\frac{3}{16}$	2.44
A 270	$2\frac{1}{4} \times 1\frac{1}{2}$	* $\frac{1}{2}$	5.6
		* $\frac{7}{16}$	5.0
		* $\frac{3}{8}$	4.4
		* $\frac{5}{16}$	3.66
		* $\frac{1}{4}$	2.98
		* $\frac{3}{16}$	2.28
A 37	$2 \times 1\frac{1}{2}$	* $\frac{3}{8}$	3.99
		* $\frac{5}{16}$	3.39
		* $\frac{1}{4}$	2.77
		* $\frac{3}{16}$	2.12
		* $\frac{1}{8}$	1.44
A 645	$2 \times 1\frac{1}{4}$	* $\frac{1}{4}$	2.55
		* $\frac{3}{16}$	1.96
A 39	$1\frac{3}{4} \times 1\frac{1}{4}$	* $\frac{1}{4}$	2.34
		* $\frac{3}{16}$	1.80
		* $\frac{1}{8}$	1.23
A 624	$1\frac{1}{2} \times 1\frac{1}{4}$	* $\frac{5}{16}$	2.59
		* $\frac{1}{4}$	2.13
		* $\frac{3}{16}$	1.64

*Special, see page 4.

ELEMENTS OF SECTIONS

DEFINITIONS

In the computations of structural designing, certain mathematical expressions are used to designate the values of structural shapes in the various conditions under which they are subjected to stress. In the pages which immediately follow, these values, usually called properties, are given in United States measurements for shapes common in structural designs, and are defined as follows:—

A—Area of Section. expressed in square inches.

Neutral Axis. Axis of moments through center of gravity of section.

x and y. Distances from the back or working line of a section to the center of gravity of section.

I—Moment of Inertia. The summation, expressed in inches to the fourth power, of the products of the elementary areas of a section by the squares of their distances from its center of gravity or other axis assumed for purposes of computation.

S—Section Modulus. The moment of inertia divided by the distance (n) from the axis of moments to the extreme fiber. In an unsymmetrical section there are two section moduli for each axis of moments, the least of which determines the safe unit stress.

r—Radius of Gyration. The distance in inches from the center of moments of a section to the point or line at which its area is considered concentrated. The radius of gyration of a section referred to any axis is always the square root of the moment of inertia of the section referred to that axis divided by the area.

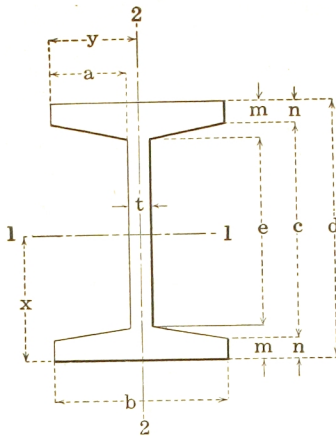
The section modulus is used to determine the stress in the extreme fiber of a shape subject to bending by dividing the bending moment by the section modulus, both expressed in like units of measurement. It is also used vice versa in the selection from a table of shapes of the proper section required to support a load by dividing the bending stress by the allowable fiber stress, both in like units of weight.

The radius of gyration is used to ascertain the safe load any section or shape will sustain when used in compression as a strut or column. The unbraced length of the section divided by the radius of gyration is denominated the ratio of slenderness.

The elements of steel sections are computed from the theoretical dimensions heretofore given by the formulas which follow and no approximations have entered into the calculations. No account has been taken of fillets or roundings, and in consequence weights figured from areas will not exactly agree with the nominal weights published.

CARNEGIE STEEL COMPANY

BEAM



$$A = dt + 2a(m+n)$$

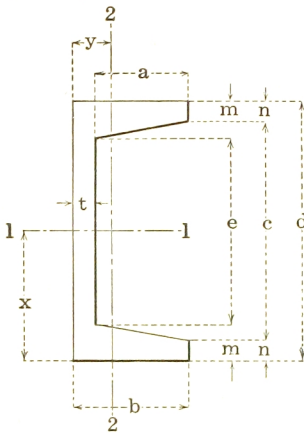
$$x = \frac{d}{2}$$

$$y = \frac{b}{2}$$

$$I_{1-1} = \frac{bd^3 - \frac{a}{4(m-n)}(c^4 - e^4)}{12}$$

$$I_{2-2} = \frac{2nb^3 + et^3 + \frac{m-n}{4a}(b^4 - t^4)}{12}$$

CHANNEL



$$A = dt + a(m+n)$$

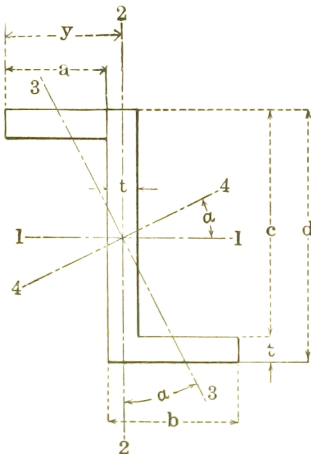
$$x = \frac{d}{2}$$

$$y = \frac{b^2n + \frac{ct^2}{2} + \frac{a(m-n)}{3}(b+2t)}{A}$$

$$I_{1-1} = \frac{bd^3 - \frac{a}{8(m-n)}(c^4 - e^4)}{12}$$

$$I_{2-2} = \frac{2nb^3 + et^3 + \frac{m-n}{2a}(b^4 - t^4)}{3} - Ay^2$$

ZEE



$$A = t(d+2a)$$

$$x = \frac{d}{2}$$

$$y = \frac{2b-t}{2}$$

$$\tan 2\alpha = \frac{(dt-t^2)(b^2-bt)}{I_{1-1}-I_{2-2}}$$

$$I_{1-1} = \frac{bd^3 - a(d-2t)^3}{12}$$

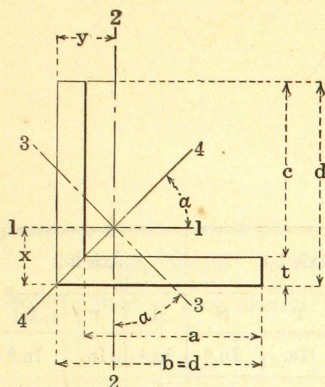
$$I_{2-2} = \frac{d(b+a)^3 - 2a^3c - 6ab^2c}{12}$$

$$I_{3-3} = \frac{I_{2-2} \cos^2 \alpha - I_{1-1} \sin^2 \alpha}{\cos 2\alpha}$$

$$I_{4-4} = \frac{I_{1-1} \cos^2 \alpha - I_{2-2} \sin^2 \alpha}{\cos 2\alpha}$$

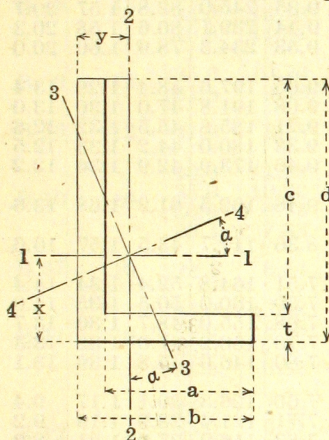
ELEMENTS OF SECTIONS

EQUAL ANGLE



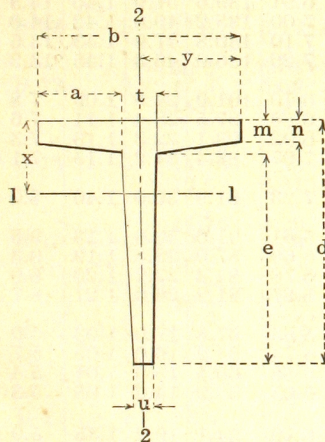
$$\begin{aligned} A &= t(b+c) \\ x &= \frac{b^2+ct}{2(b+c)} \\ y &= x \\ \alpha &= 45^\circ \\ I_{1-1} &= \frac{t(b-x)^3+bx^3-a(x-t)^3}{3} \\ I_{2-2} &= I_{1-1} \\ I_{3-3} &= \frac{ct^3+c^3t+3ct(b-4x+2t)^2+t^4+6t^2(2x-t)^2}{12} \\ I_{4-4} &= \frac{ct^3+c^3t+3ctb^2+t^4}{12} \end{aligned}$$

UNEQUAL ANGLE



$$\begin{aligned} A &= t(b+c) \\ x &= \frac{t(b+2c)+c^2}{2(b+c)} \\ y &= \frac{t(2a+d)+a^2}{2(a+d)} \\ \tan 2\alpha &= \frac{t[(2y-t)d(d-2x)+a(2x-t)(b+t-2y)]}{2(I_{1-1}-I_{2-2})} \\ I_{1-1} &= \frac{t(d-x)^3+bx^3-a(x-t)^3}{3} \\ I_{2-2} &= \frac{t(b-y)^3+dy^3-c(y-t)^3}{3} \\ I_{3-3} &= \frac{I_{2-2}\cos^2\alpha-I_{1-1}\sin^2\alpha}{\cos 2\alpha} \\ I_{4-4} &= \frac{I_{1-1}\cos^2\alpha-I_{2-2}\sin^2\alpha}{\cos 2\alpha} \end{aligned}$$

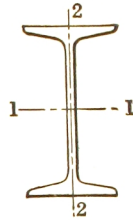
TEE



$$\begin{aligned} A &= \frac{e(t+u)}{2} + mt + a(m+n) \\ x &= \frac{6an^2+2a(m-n)(m+2n)+3td^2-e(t-u)(3d-e)}{6A} \\ y &= \frac{b}{2} \\ I_{1-1} &= \frac{e^3(3u+t)+4bm^3-2a(m-n)^3}{12} - A(x-m)^2 \\ I_{2-2} &= \frac{nb^3+(m-n)t^3+eu^3}{12} \\ &\quad + \frac{a(m-n)[2a^2+(2a+3t)^2]}{36} \\ &\quad + \frac{e(t-u)[(t-u)^2+2(t+2u)^2]}{144} \end{aligned}$$

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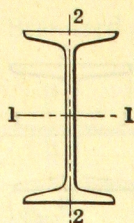
ELEMENTS OF STRUCTURAL BEAMS



Section Index	Depth of Beam	Weight per Foot	Area of Section	Width of Flange	Thickness of Web	Axis 1-1			Axis 2-2		
						I	r	S	I	r	S
						In. ⁴	In.	In. ³	In. ⁴	In.	In. ³
B 61	27	90.0	26.34	9.000	0.524	2958.3	10.60	219.1	75.3	1.69	16.7
B 18	24	115.0	33.67	7.987	0.737	2940.5	9.35	245.0	82.8	1.57	20.7
		110.0	32.18	7.925	0.675	2869.1	9.44	239.1	80.6	1.58	20.3
		105.9	30.98	7.875	0.625	2811.5	9.53	234.3	78.9	1.60	20.0
B 1	24	100.0	29.25	7.247	0.747	2371.8	9.05	197.6	48.4	1.29	13.4
		95.0	27.79	7.186	0.686	2301.5	9.08	191.8	47.0	1.30	13.0
		90.0	26.30	7.124	0.624	2230.1	9.21	185.8	45.5	1.32	12.8
		85.0	24.84	7.063	0.563	2159.8	9.33	180.0	44.2	1.33	12.5
		79.9	23.33	7.000	0.500	2087.2	9.46	173.9	42.9	1.36	12.2
B 62	24	74.2	21.70	9.000	0.476	1950.1	9.48	162.5	61.2	1.68	13.6
B 63	21	60.4	17.68	8.250	0.428	1235.5	8.36	117.7	43.5	1.57	10.6
B 2	20	100.0	29.20	7.273	0.873	1648.3	7.51	164.8	52.4	1.34	14.4
		95.0	27.74	7.200	0.800	1599.7	7.59	160.0	50.5	1.35	14.0
		90.0	26.26	7.126	0.726	1550.3	7.68	155.0	48.7	1.36	13.7
		85.0	24.80	7.053	0.653	1501.7	7.78	150.2	47.0	1.38	13.3
		81.4	23.74	7.000	0.600	1466.3	7.86	146.6	45.8	1.39	13.1
B 3	20	75.0	21.90	6.391	0.641	1263.5	7.60	126.3	30.1	1.17	9.4
		70.0	20.42	6.317	0.567	1214.2	7.71	121.4	28.9	1.19	9.2
		65.4	19.08	6.250	0.500	1169.5	7.83	116.9	27.9	1.21	8.9
B 19	18	90.0	26.29	7.236	0.796	1256.5	6.91	139.6	51.9	1.40	14.3
		85.0	24.81	7.154	0.714	1216.6	7.00	135.2	49.8	1.42	14.0
		80.0	23.34	7.072	0.632	1176.8	7.10	130.8	47.9	1.43	13.6
		75.6	22.04	7.000	0.560	1141.8	7.20	126.9	46.3	1.45	13.2
B 4	18	70.0	20.46	6.251	0.711	917.5	6.70	101.9	24.5	1.09	7.8
		65.0	18.98	6.169	0.629	877.7	6.80	97.5	23.4	1.11	7.6
		60.0	17.50	6.087	0.547	837.8	6.92	93.1	22.3	1.13	7.3
		54.7	15.94	6.000	0.460	795.5	7.07	88.4	21.2	1.15	7.1
B 64	18	48.2	14.09	7.500	0.380	737.1	7.23	81.9	30.0	1.46	8.0
B 6	15	75.0	21.85	6.278	0.868	687.2	5.61	91.6	30.6	1.18	9.8
		70.0	20.38	6.180	0.770	659.6	5.69	87.9	28.8	1.19	9.3
		65.0	18.91	6.082	0.672	632.1	5.78	84.3	27.2	1.20	8.9
		60.8	17.68	6.000	0.590	609.0	5.87	81.2	26.0	1.21	8.7
B 7	15	55.0	16.06	5.738	0.648	508.7	5.63	67.8	17.0	1.03	5.9
		50.0	14.59	5.640	0.550	481.1	5.74	64.2	16.0	1.05	5.7
		45.0	13.12	5.542	0.452	453.6	5.88	60.5	15.0	1.07	5.4
		42.9	12.49	5.500	0.410	441.8	5.95	58.9	14.6	1.08	5.3
B 65	15	37.3	10.91	6.750	0.332	405.5	6.10	54.1	19.9	1.35	5.9

ELEMENTS OF SECTIONS

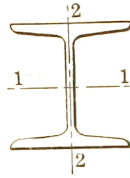
ELEMENTS OF STRUCTURAL BEAMS—Concluded



Section Index	Depth of Beam	Weight per Foot	Area of Section	Width of Flange	Thickness of Web	Axis 1-1			Axis 2-2		
						I	r	S	I	r	S
						In. ⁴	In.	In. ³	In. ⁴	In.	In. ³
B 8	12	55.0	16.04	5.600	0.810	319.3	4.46	53.2	17.3	1.04	6.2
		50.0	14.57	5.477	0.687	301.6	4.55	50.3	16.0	1.05	5.8
		45.0	13.10	5.355	0.565	284.1	4.66	47.3	14.8	1.06	5.5
		40.8	11.84	5.250	0.460	268.9	4.77	44.8	13.8	1.08	5.3
B 9	12	35.0	10.20	5.078	0.428	227.0	4.72	37.8	10.0	0.99	3.9
		31.8	9.26	5.000	0.350	215.8	4.83	36.0	9.5	1.01	3.8
B 66	12	27.9	8.15	6.000	0.284	199.4	4.95	33.2	12.6	1.24	4.2
B 10	10	40.0	11.69	5.091	0.741	158.0	3.68	31.6	9.4	0.90	3.7
		35.0	10.22	4.944	0.594	145.8	3.78	29.2	8.5	0.91	3.4
		30.0	8.75	4.797	0.447	133.5	3.91	26.7	7.6	0.93	3.2
		25.4	7.38	4.660	0.310	122.1	4.07	24.4	6.9	0.97	3.0
B 67	10	22.4	6.54	5.500	0.252	113.6	4.17	22.7	9.0	1.17	3.3
B 11	9	35.0	10.22	4.764	0.724	111.3	3.30	24.7	7.3	0.84	3.0
		30.0	8.76	4.601	0.561	101.4	3.40	22.5	6.4	0.85	2.8
		25.0	7.28	4.437	0.397	91.4	3.54	20.3	5.6	0.88	2.5
		21.8	6.32	4.330	0.290	84.9	3.67	18.9	5.2	0.90	2.4
B 12	8	25.5	7.43	4.262	0.532	68.1	3.03	17.0	4.7	0.80	2.2
		23.0	6.71	4.171	0.441	64.2	3.09	16.0	4.4	0.81	2.1
		20.5	5.97	4.079	0.349	60.2	3.18	15.1	4.0	0.82	2.0
		18.4	5.34	4.000	0.270	56.9	3.26	14.2	3.8	0.84	1.9
B 68	8	17.5	5.13	5.000	0.220	58.4	3.38	14.6	6.2	1.10	2.5
B 13	7	20.0	5.83	3.860	0.450	41.9	2.68	12.0	3.1	0.74	1.6
		17.5	5.09	3.755	0.345	38.9	2.77	11.1	2.9	0.76	1.6
		15.3	4.43	3.660	0.250	36.2	2.86	10.4	2.7	0.78	1.5
B 14	6	17.25	5.02	3.565	0.465	26.0	2.28	8.7	2.3	0.68	1.3
		14.75	4.29	3.443	0.343	23.8	2.36	7.9	2.1	0.69	1.2
		12.5	3.61	3.330	0.230	21.8	2.46	7.3	1.8	0.72	1.1
B 15	5	14.75	4.29	3.284	0.494	15.0	1.87	6.0	1.7	0.63	1.0
		12.25	3.56	3.137	0.347	13.5	1.95	5.4	1.4	0.63	0.91
		10.0	2.87	3.000	0.210	12.1	2.05	4.8	1.2	0.65	0.82
B 16	4	10.5	3.05	2.870	0.400	7.1	1.52	3.5	1.0	0.57	0.70
		9.5	2.76	2.796	0.326	6.7	1.56	3.3	0.91	0.58	0.65
		8.5	2.46	2.723	0.253	6.3	1.60	3.2	0.83	0.58	0.61
		7.7	2.21	2.660	0.190	6.0	1.64	3.0	0.77	0.59	0.58
B 17	3	7.5	2.17	2.509	0.349	2.9	1.15	1.9	0.59	0.52	0.47
		6.5	1.88	2.411	0.251	2.7	1.19	1.8	0.51	0.52	0.43
		5.7	1.64	2.330	0.170	2.5	1.23	1.7	0.46	0.53	0.40

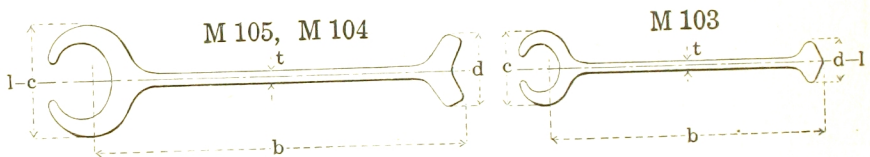
CARNEGIE STEEL COMPANY

ELEMENTS OF H BEAMS



Section Index	Depth of Beam	Weight per Foot	Area of Section	Width of Flange	Thick-ness of Web	Axis 1-1			Axis 2-2		
						I	r	S	I	r	S
						In. ⁴	In.	In. ³	In. ⁴	In.	In. ³
H 4	8	34.3	10.01	8.0	.375	115.4	3.40	28.9	35.1	1.87	8.8
H 3	6	24.1	7.01	6.0	.313	45.1	2.54	15.0	14.7	1.45	4.9
H 2	5	18.9	5.47	5.0	.313	23.8	2.08	9.5	7.9	1.20	3.1
H 1	4	13.8	4.00	4.0	.313	10.7	1.63	5.3	3.6	0.95	1.8

ELEMENTS OF U. S. STEEL SHEET PILING SECTIONS

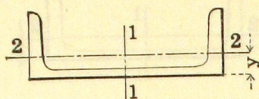


Section Index	Dimensions				Weight per Foot	Area of Section	Axis 1-1		
	b	c	d	t			I	r	S
	In.	In.	In.	In.			In. ⁴	In.	In. ³
M 105	13 1/4	3 15/16	2 1/2	1/2	42.5	12.51	8.56	0.83	4.35
M 104	13 1/4	3 15/16	2 1/2	3/8	38	11.30	8.50	0.87	4.32
M 103	9 1/4	2 9/16	1 5/8	1/4	16	4.71	1.45	0.56	1.13

ELEMENTS OF SECTIONS

ELEMENTS OF STRUCTURAL CHANNELS

American Standard Sections



Section Index	Depth of Channel	Weight per Foot	Area of Section	Width of Flange	Thick-ness of Web	Axis 1-1			Axis 2-2			
						I	r	S	I	r	S	y
						In. ⁴	In.	In. ³	In. ⁴	In.	In. ³	In.
C 1	15	55.0	16.11	3.814	0.814	429.0	5.16	57.2	12.1	0.87	4.1	0.82
		50.0	14.64	3.716	0.716	401.4	5.24	53.6	11.2	0.87	3.8	0.80
		45.0	13.17	3.618	0.618	373.9	5.33	49.8	10.3	0.88	3.6	0.79
		40.0	11.70	3.520	0.520	346.3	5.44	46.2	9.3	0.89	3.4	0.78
		35.0	10.23	3.422	0.422	318.7	5.58	42.5	8.4	0.91	3.2	0.79
		33.9	9.90	3.400	0.400	312.6	5.62	41.7	8.2	0.91	3.2	0.79
C 2	12	40.0	11.73	3.415	0.755	196.5	4.09	32.8	6.6	0.75	2.5	0.72
		35.0	10.26	3.292	0.632	178.8	4.18	29.8	5.9	0.76	2.3	0.69
		30.0	8.79	3.170	0.510	161.2	4.28	26.9	5.2	0.77	2.1	0.68
		25.0	7.32	3.047	0.387	143.5	4.43	23.9	4.5	0.79	1.9	0.68
		20.7	6.03	2.940	0.280	128.1	4.61	21.4	3.9	0.81	1.7	0.70
C 3	10	35.0	10.27	3.180	0.820	115.2	3.34	23.0	4.6	0.67	1.9	0.69
		30.0	8.80	3.033	0.673	103.0	3.42	20.6	4.0	0.67	1.7	0.65
		25.0	7.33	2.886	0.526	90.7	3.52	18.1	3.4	0.68	1.5	0.62
		20.0	5.86	2.739	0.379	78.5	3.66	15.7	2.8	0.70	1.3	0.61
		15.3	4.47	2.600	0.240	66.9	3.87	13.4	2.3	0.72	1.2	0.64
C 4	9	25.0	7.33	2.812	0.612	70.5	3.10	15.7	3.0	0.64	1.4	0.61
		20.0	5.86	2.648	0.448	60.6	3.22	13.5	2.4	0.65	1.2	0.59
		15.0	4.39	2.485	0.285	50.7	3.40	11.3	1.9	0.67	1.0	0.59
		13.4	3.89	2.430	0.230	47.3	3.49	10.5	1.8	0.67	0.97	0.61
C 5	8	21.25	6.23	2.619	0.579	47.6	2.77	11.9	2.2	0.60	1.1	0.59
		18.75	5.49	2.527	0.487	43.7	2.82	10.9	2.0	0.60	1.0	0.57
		16.25	4.76	2.435	0.395	39.8	2.89	9.9	1.8	0.61	0.94	0.56
		13.75	4.02	2.343	0.303	35.8	2.99	9.0	1.5	0.62	0.86	0.56
		11.5	3.36	2.260	0.220	32.3	3.10	8.1	1.3	0.63	0.79	0.58
C 6	7	19.75	5.79	2.509	0.629	33.1	2.39	9.4	1.8	0.56	0.96	0.58
		17.25	5.05	2.404	0.524	30.1	2.44	8.6	1.6	0.56	0.86	0.55
		14.75	4.32	2.299	0.419	27.1	2.51	7.7	1.4	0.57	0.79	0.53
		12.25	3.58	2.194	0.314	24.1	2.59	6.9	1.2	0.58	0.71	0.53
		9.8	2.85	2.090	0.210	21.1	2.72	6.0	0.98	0.59	0.63	0.55
C 7	6	15.5	4.54	2.279	0.559	19.5	2.07	6.5	1.3	0.53	0.73	0.55
		13.0	3.81	2.157	0.437	17.3	2.13	5.8	1.1	0.53	0.65	0.52
		10.5	3.07	2.034	0.314	15.1	2.22	5.0	0.87	0.53	0.57	0.50
		8.2	2.39	1.920	0.200	13.0	2.34	4.3	0.70	0.54	0.50	0.52
C 8	5	11.5	3.36	2.032	0.472	10.4	1.76	4.1	0.82	0.49	0.54	0.51
		9.0	2.63	1.885	0.325	8.8	1.83	3.5	0.64	0.49	0.45	0.48
		6.7	1.95	1.750	0.190	7.4	1.95	3.0	0.48	0.50	0.38	0.49
C 9	4	7.25	2.12	1.720	0.320	4.5	1.47	2.3	0.44	0.46	0.35	0.46
		6.25	1.82	1.647	0.247	4.1	1.50	2.1	0.38	0.45	0.32	0.46
		5.4	1.56	1.580	0.180	3.8	1.56	1.9	0.32	0.45	0.29	0.46
C 10	3	6.0	1.75	1.596	0.356	2.1	1.08	1.4	0.31	0.42	0.27	0.46
		5.0	1.46	1.498	0.258	1.8	1.12	1.2	0.25	0.41	0.24	0.44
		4.1	1.19	1.410	0.170	1.6	1.17	1.1	0.20	0.41	0.21	0.44

CARNEGIE STEEL COMPANY

ELEMENTS OF SHIP BUILDING CHANNELS
American Standard Sections



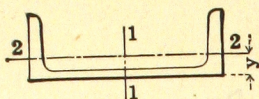
Section Index	Depth of Channel	Wt. per Foot	Area of Section	Width of Flange	Thickness of Web	Axis 1-1			Axis 2-2			
						I	r	S	I	r	S	y
		In.	Lbs.	In.	In.	In. ⁴	In.	In. ³	In. ⁴	In.	In. ³	In.
†C 60	18	58.0	16.98	4.200	.700	670.7	6.29	74.5	18.5	1.04	5.6	0.88
		51.9	15.18	4.100	.600	622.1	6.40	69.1	17.1	1.06	5.3	0.87
		45.8	13.38	4.000	.500	573.5	6.55	63.7	15.8	1.09	5.1	0.89
		42.7	12.48	3.950	.450	549.2	6.64	61.0	15.0	1.10	4.9	0.90
C 21 (BSC 26)	12	44.7	13.05	4.200	.725	245.0	4.33	40.8	16.8	1.14	5.3	1.04
		40.6	11.85	4.100	.625	230.6	4.41	38.4	15.5	1.15	5.1	1.04
		36.5	10.65	4.000	.525	216.2	4.51	36.0	14.2	1.16	4.8	1.06
		34.5	10.05	3.950	.475	209.0	4.57	34.8	13.5	1.16	4.7	1.07
C 171 (BSC 25)	12	41.1	12.00	3.700	.700	217.8	4.26	36.3	11.3	0.97	4.0	0.89
		37.0	10.80	3.600	.600	203.4	4.34	33.9	10.3	0.98	3.8	0.89
		32.9	9.60	3.500	.500	189.0	4.44	31.5	9.4	0.99	3.6	0.89
		30.9	9.00	3.450	.450	181.8	4.50	30.3	8.9	0.99	3.5	0.90
C 26 (BSC 21)	10	37.0	10.81	4.200	.675	146.3	3.68	29.3	14.9	1.18	4.8	1.10
		33.6	9.81	4.100	.575	138.0	3.75	27.6	13.7	1.18	4.6	1.11
		30.2	8.81	4.000	.475	129.7	3.84	25.9	12.5	1.19	4.3	1.13
		28.5	8.31	3.950	.425	125.5	3.89	25.1	11.8	1.19	4.2	1.15
C 27 (BSC 20)	10	35.1	10.23	3.700	.675	133.6	3.61	26.7	10.4	1.01	3.8	0.95
		31.7	9.23	3.600	.575	125.2	3.69	25.0	9.5	1.01	3.6	0.95
		28.3	8.23	3.500	.475	116.9	3.77	23.4	8.6	1.02	3.4	0.96
		26.6	7.73	3.450	.425	112.7	3.82	22.5	8.1	1.02	3.3	0.97
C 28 (BSC 19)	10	24.9	7.23	3.400	.375	108.6	3.88	21.7	7.6	1.03	3.2	0.98
		25.3	7.38	3.550	.425	106.0	3.79	21.2	7.9	1.04	3.0	0.94
		23.6	6.88	3.500	.375	101.8	3.85	20.4	7.5	1.04	2.9	0.96
		21.9	6.38	3.450	.325	97.6	3.91	19.5	7.0	1.05	2.8	0.98
C 31 (BSC 18)	9	34.7	10.13	4.200	.675	113.0	3.34	25.1	14.5	1.20	4.8	1.15
		31.7	9.23	4.100	.575	106.9	3.40	23.8	13.3	1.20	4.5	1.16
		28.6	8.33	4.000	.475	100.9	3.48	22.4	12.1	1.20	4.3	1.18
		27.1	7.88	3.950	.425	97.8	3.52	21.7	11.4	1.20	4.2	1.20
C 32 (BSC 17)	9	31.6	9.21	3.700	.650	99.4	3.29	22.1	9.7	1.03	3.6	0.98
		28.5	8.31	3.600	.550	93.4	3.35	20.7	8.8	1.03	3.4	0.98
		25.4	7.41	3.500	.450	87.3	3.43	19.4	8.0	1.04	3.2	1.00
		23.9	6.96	3.450	.400	84.3	3.48	18.7	7.5	1.04	3.1	1.01
C 36 (BSC 13)	8	28.2	8.23	3.700	.625	71.8	2.95	18.0	9.0	1.05	3.4	1.02
		25.5	7.43	3.600	.525	67.6	3.02	16.9	8.2	1.05	3.2	1.02
		22.8	6.63	3.500	.425	63.3	3.09	15.8	7.4	1.05	3.0	1.04
		21.4	6.23	3.450	.375	61.2	3.13	15.3	6.9	1.05	2.9	1.05
C 37 (BSC 12)	8	25.5	7.43	3.225	.600	62.6	2.90	15.6	5.8	0.89	2.5	0.86
		22.7	6.63	3.125	.500	58.3	2.97	14.6	5.3	0.89	2.3	0.85
		20.0	5.83	3.025	.400	54.0	3.05	13.5	4.7	0.90	2.2	0.86
		19.3	5.63	3.000	.375	53.0	3.07	13.2	4.5	0.90	2.1	0.87
		18.7	5.43	2.975	.350	51.9	3.09	13.0	4.4	0.90	2.1	0.88

Dimensions and properties of the British Standard Sections are indicated in **bold type**.
†C 60 is not an American Standard Section; profile is shown on page 24 with Structural Channels.

ELEMENTS OF SECTIONS

ELEMENTS OF SHIP BUILDING CHANNELS

American Standard Sections



Section Index	Depth of Channel	Wt. per Foot	Area of Section	Width of Flange	Thickness of Web	Axis 1-1			Axis 2-2			
						I	r	S	I	r	S	y
						In. ⁴	In.	In. ³	In. ⁴	In.	In. ³	In.
C 41 (BSC 10)	7	25.0	7.30	3.700	0.600	49.9	2.62	14.3	8.3	1.07	3.2	1.06
		22.7	6.60	3.600	0.500	47.1	2.67	13.5	7.5	1.07	3.0	1.07
		20.3	5.90	3.500	0.400	44.2	2.74	12.6	6.7	1.07	2.8	1.09
		19.1	5.55	3.450	0.350	42.8	2.78	12.2	6.3	1.07	2.7	1.11
C 42 (BSC 9)	7	20.0	5.82	3.100	0.475	40.2	2.63	11.5	4.7	0.90	2.1	0.88
		17.6	5.12	3.000	0.375	37.3	2.70	10.7	4.2	0.90	2.0	0.90
		16.4	4.77	2.950	0.325	35.9	2.74	10.2	3.9	0.90	1.9	0.91
C 46 (BSC 8)	6	22.0	6.42	3.700	0.575	33.0	2.27	11.0	7.6	1.09	2.9	1.12
		20.0	5.82	3.600	0.475	31.2	2.32	10.4	6.9	1.09	2.8	1.13
		18.0	5.22	3.500	0.375	29.4	2.38	9.8	6.1	1.08	2.6	1.15
		16.9	4.92	3.450	0.325	28.5	2.41	9.5	5.7	1.08	2.5	1.17
C 109	6	15.3	4.48	3.500	0.340	25.3	2.38	8.4	5.1	1.08	2.1	1.08
C 47 (BSC 7)	6	16.3	4.75	3.000	0.375	25.8	2.33	8.6	4.0	0.91	1.9	0.95
		15.1	4.37	2.938	0.313	24.7	2.38	8.2	3.6	0.91	1.8	0.97
C 48 (BSC 5)	6	13.3	3.90	2.563	0.375	19.7	2.25	6.6	2.1	0.74	1.2	0.71
		12.0	3.52	2.500	0.313	18.6	2.30	6.2	2.0	0.75	1.1	0.72

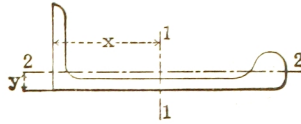
Dimensions and properties of the British Standard Sections are indicated in **bold type**.

ELEMENTS OF CAR BUILDING CHANNELS

†C 20	13	50.0	14.66	4.412	0.787	312.9	4.62	48.1	16.7	1.07	4.9	0.98
		45.0	13.18	4.298	0.673	292.0	4.71	44.9	15.3	1.08	4.6	0.97
		40.0	11.71	4.185	0.560	271.4	4.82	41.7	13.9	1.09	4.3	0.97
		37.0	10.82	4.117	0.492	258.9	4.89	39.8	13.0	1.10	4.2	0.98
		35.0	10.24	4.072	0.447	250.7	4.95	38.6	12.5	1.10	4.0	0.99
		31.8	9.30	4.000	0.375	237.5	5.05	36.5	11.6	1.11	3.9	1.01
		50.0	14.64	4.135	0.835	268.1	4.28	44.7	17.8	1.10	5.8	1.06
†C 170	12	48.6	14.22	4.100	0.800	263.0	4.30	43.8	17.3	1.10	5.7	1.05
		46.6	13.62	4.050	0.750	255.8	4.33	42.6	16.6	1.11	5.5	1.05
		44.5	13.02	4.000	0.700	248.6	4.37	41.4	16.0	1.11	5.4	1.05
		40.0	11.70	3.890	0.590	232.8	4.46	38.8	14.5	1.12	5.1	1.05
		35.0	10.23	3.767	0.467	215.1	4.59	35.8	12.9	1.12	4.8	1.07
		50.0	14.64	4.135	0.835	268.1	4.28	44.7	17.8	1.10	5.8	1.06
C 106	5 3/4	17.0	4.99	3.500	0.375	26.1	2.29	9.1	5.9	1.08	2.5	1.15
C 200	4	13.8	4.00	2.500	0.500	8.8	1.49	4.4	2.2	0.74	1.4	0.86
C 220	4	10.1	2.96	2.087	0.394	6.6	1.47	3.3	1.1	0.62	0.79	0.67
C 190	3	7.1	2.06	1.984	0.250	2.8	1.17	1.9	0.75	0.60	0.60	0.72

†Profiles of C 20 and C 170 are shown on pages 24 and 25 with Structural Channels.

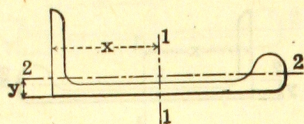
ELEMENTS OF SHIP BUILDING BULB ANGLES
American Standard Sections



Section Index	Size	Thick-ness of Web	Wt. per Foot	Area of Section	Axis 1-1				Axis 2-2			
					I	r	S	x	I	r	S	y
	Inches	In.	Lbs.	In. ²	In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.
BA 195	10 x 3½	0.725	35.2	10.35	122.0	3.43	22.3	4.53	6.3	0.78	2.3	0.76
		0.675	33.2	9.77	115.9	3.44	21.2	4.52	5.8	0.77	2.1	0.74
BA 196	10 x 3½	0.625	31.1	9.14	110.4	3.48	20.3	4.56	5.6	0.78	2.0	0.72
		0.575	29.1	8.55	104.3	3.49	19.2	4.56	5.1	0.77	1.9	0.70
BA 197 (BSBA 18)	10 x 3½	0.525	26.9	7.90	98.2	3.53	18.3	4.62	4.8	0.78	1.7	0.69
		0.475	24.9	7.32	92.1	3.55	17.2	4.63	4.4	0.78	1.6	0.68
BA 205	9½ x 3½	0.600	28.8	8.47	93.0	3.32	17.9	4.30	5.3	0.79	1.9	0.73
		0.550	26.9	7.91	87.8	3.33	16.9	4.29	4.9	0.79	1.8	0.71
BA 206 (BSBA 17)	9½ x 3½	0.500	24.7	7.28	82.4	3.37	16.0	4.36	4.6	0.79	1.6	0.69
		0.450	22.8	6.72	77.1	3.39	15.1	4.36	4.2	0.79	1.5	0.68
BA 201	9 x 3½	0.675	30.4	8.95	86.3	3.11	17.2	4.00	5.8	0.81	2.1	0.76
		0.625	28.6	8.41	81.8	3.12	16.4	3.98	5.4	0.80	2.0	0.74
BA 202	9 x 3½	0.575	26.6	7.82	77.6	3.15	15.6	4.03	5.1	0.81	1.8	0.73
		0.525	24.8	7.29	73.1	3.17	14.8	4.03	4.7	0.80	1.7	0.71
BA 203 (BSBA 16)	9 x 3½	0.475	22.7	6.68	68.4	3.20	13.9	4.10	4.3	0.81	1.5	0.70
		0.425	20.9	6.14	63.8	3.22	13.1	4.10	3.9	0.80	1.4	0.68
BA 208	8½ x 3½	0.575	25.3	7.43	65.5	2.97	13.8	3.74	5.0	0.82	1.8	0.74
		0.525	23.5	6.92	61.7	2.98	13.0	3.73	4.6	0.82	1.7	0.72
BA 209 (BSBA 14)	8½ x 3½	0.475	21.6	6.34	57.7	3.02	12.3	3.80	4.3	0.82	1.5	0.71
		0.425	19.8	5.83	53.8	3.04	11.5	3.80	3.9	0.82	1.4	0.69
BA 211	8½ x 3	0.550	23.4	6.89	60.1	2.96	13.1	3.89	3.1	0.67	1.3	0.63
		0.500	21.7	6.39	56.4	2.97	12.3	3.89	2.8	0.66	1.2	0.61
BA 212 (BSBA 13)	8½ x 3	0.450	19.8	5.84	52.7	3.00	11.6	3.96	2.6	0.67	1.1	0.60
		0.400	18.1	5.34	48.9	3.03	10.8	3.96	2.3	0.66	0.99	0.58

Dimensions and properties of the British Standard Sections are indicated in **bold type**.

ELEMENTS OF SECTIONS

ELEMENTS OF SHIP BUILDING BULB ANGLES
American Standard Sections

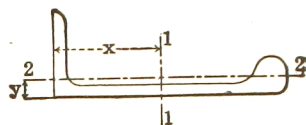
Section Index	Size	Thick-ness of Web	Wt. per Foot	Area of Section	Axis 1-1				Axis 2-2			
					I	r	S	x	I	r	S	y
	Inches	In.	Lbs.	In. ²	In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.
BA 214	8 x 3½	0.550	23.2	6.83	53.7	2.81	11.9	3.49	4.8	0.84	1.7	0.75
		0.500	21.6	6.34	50.4	2.82	11.2	3.48	4.4	0.83	1.6	0.73
BA 215 (BSBA 12)	8 x 3½	0.450	19.6	5.78	47.1	2.85	10.6	3.54	4.0	0.84	1.4	0.71
		0.400	18.0	5.29	43.8	2.88	9.8	3.54	3.7	0.83	1.3	0.70
BA 217	8 x 3	0.575	23.1	6.78	52.4	2.78	12.0	3.64	3.2	0.69	1.3	0.65
		0.525	21.4	6.31	49.2	2.79	11.3	3.63	2.9	0.68	1.2	0.63
BA 218 (BSBA 11)	8 x 3	0.475	19.6	5.78	46.1	2.82	10.6	3.70	2.7	0.69	1.1	0.62
		0.425	18.0	5.30	42.9	2.84	10.0	3.70	2.4	0.68	1.0	0.60
BA 220	7½ x 3½	0.575	22.8	6.71	46.2	2.63	10.8	3.24	4.9	0.86	1.8	0.77
		0.525	21.2	6.24	43.4	2.64	10.2	3.23	4.5	0.85	1.7	0.75
BA 221 (BSBA 10)	7½ x 3½	0.475	19.4	5.70	40.6	2.67	9.6	3.29	4.2	0.85	1.5	0.73
		0.425	17.8	5.24	37.8	2.69	9.0	3.29	3.8	0.85	1.4	0.72
BA 223	7½ x 3	0.525	20.3	5.98	41.0	2.62	9.9	3.36	2.9	0.69	1.2	0.64
		0.475	18.8	5.53	38.4	2.63	9.3	3.35	2.6	0.69	1.1	0.62
BA 224 (BSBA 9)	7½ x 3	0.425	17.1	5.02	35.7	2.67	8.8	3.42	2.4	0.69	1.0	0.61
		0.375	15.6	4.57	33.1	2.69	8.2	3.42	2.2	0.69	0.92	0.60
BA 226	7 x 3½	0.525	20.0	5.90	35.5	2.45	8.8	2.95	4.5	0.87	1.6	0.77
		0.475	18.6	5.46	33.2	2.47	8.2	2.94	4.1	0.88	1.5	0.75
BA 227 (BSBA 8)	7 x 3½	0.425	16.8	4.94	30.9	2.50	7.7	3.00	3.7	0.87	1.4	0.74
		0.375	15.3	4.50	28.6	2.52	7.2	2.99	3.4	0.87	1.2	0.72
BA 229	7 x 3	0.500	18.4	5.41	32.5	2.45	8.3	3.09	2.7	0.71	1.3	0.65
		0.450	16.9	4.98	30.3	2.46	7.8	3.08	2.5	0.70	1.2	0.63
BA 230 (BSBA 7)	7 x 3	0.400	15.3	4.50	28.1	2.50	7.3	3.14	2.3	0.71	1.1	0.61
		0.350	13.9	4.07	25.9	2.52	6.7	3.14	2.0	0.70	1.0	0.60

Dimensions and properties of the British Standard Sections are indicated in **bold type**.

CARNEGIE STEEL COMPANY

ELEMENTS OF SHIP BUILDING BULB ANGLES

American Standard Sections



Section Index	Size	Thick-ness of Web	Wt. per Foot	Area of Section	Axis 1-1				Axis 2-2			
					I	r	S	x	I	r	S	y
	Inches	In.	Lbs.	In. ²	In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.
BA 233 (BSBA 6)	6½ x 3½	0.400	15.0	4.42	23.9	2.33	6.3	2.72	3.5	0.89	1.3	0.75
		0.350	13.6	4.01	22.1	2.35	5.9	2.71	3.1	0.89	1.2	0.73
BA 236 (BSBA 5)	6½ x 3	0.425	15.0	4.40	23.5	2.31	6.4	2.87	2.3	0.73	0.97	0.64
		0.375	13.6	4.00	21.7	2.33	6.0	2.87	2.1	0.72	0.88	0.62
	6½ x 3	0.350	12.9	3.80	20.8	2.34	5.7	2.86	2.0	0.72	0.84	0.61
*Lloyd	6 x 3½	0.475	16.4	4.82	21.4	2.11	6.0	2.44	4.0	0.91	1.5	0.80
		0.425	14.8	4.34	19.9	2.14	5.6	2.49	3.6	0.92	1.3	0.78
*Lloyd	6 x 3½	0.375	13.4	3.95	18.4	2.16	5.2	2.49	3.3	0.91	1.2	0.76
		0.350	12.8	3.76	17.6	2.17	5.0	2.48	3.1	0.91	1.1	0.76
BA 241	6 x 3	0.525	16.8	4.95	21.7	2.09	6.3	2.56	2.8	0.75	1.2	0.69
		0.475	15.6	4.58	20.2	2.10	5.9	2.55	2.5	0.74	1.1	0.67
BA 242 (BSBA 4)	6 x 3	0.425	14.1	4.14	18.8	2.13	5.5	2.60	2.3	0.75	0.96	0.66
		0.375	12.8	3.76	17.4	2.15	5.1	2.60	2.1	0.74	0.87	0.64
	6 x 3	0.350	12.2	3.58	16.6	2.16	4.9	2.59	1.9	0.74	0.83	0.63
BA 244	5½ x 3	0.500	15.1	4.45	16.5	1.92	5.1	2.31	2.6	0.76	1.1	0.71
		0.450	13.9	4.10	15.3	1.93	4.8	2.30	2.4	0.76	1.0	0.69
BA 245 (BSBA 3)	5½ x 3	0.400	12.5	3.68	14.2	1.96	4.5	2.35	2.1	0.76	0.90	0.67
		0.350	11.3	3.33	13.0	1.98	4.1	2.35	1.9	0.76	0.81	0.65
	5½ x 3	0.325	10.7	3.16	12.5	1.99	4.0	2.34	1.8	0.75	0.77	0.64
BA 251 (BSBA 2)	5 x 2½	0.375	10.4	3.06	9.7	1.78	3.4	2.20	1.2	0.62	0.58	0.56
		0.325	9.3	2.74	8.8	1.79	3.1	2.19	1.0	0.61	0.52	0.54
	5 x 2½	0.300	8.8	2.59	8.4	1.80	3.0	2.19	0.95	0.61	0.49	0.53

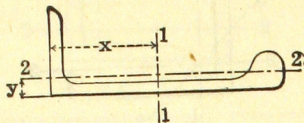
*Lloyd section, rolled by Pencoyd Iron Works (Pencoyd 60A).

Dimensions and properties of the British Standard Sections are indicated in **bold type**.

ELEMENTS OF SECTIONS

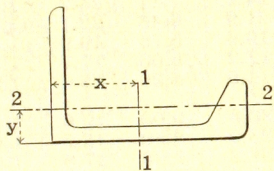
ELEMENTS OF SHIP BUILDING BULB ANGLES

Miscellaneous Sections



Section Index	Sizes	Thick-ness of Web	Wt. per Foot	Area of Section	Axis 1-1				Axis 2-2			
					I	r	S	x	I	r	S	y
	Inches	In.	Lbs.	In. ²	In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.
BA 143	5 x 2½	0.240	8.3	2.44	8.6	1.89	3.4	2.41	0.91	0.61	0.47	0.55
BA 144	4½ x 2¼	0.220	6.7	1.95	5.6	1.69	2.4	2.12	0.60	0.56	0.34	0.50
BA 145	3 x 2	0.190	3.60	1.08	1.3	1.09	0.74	1.24	0.31	0.54	0.20	0.45
BA 146	3 x 1¾	0.160	3.25	0.97	1.2	1.13	0.72	1.31	0.21	0.47	0.16	0.41
BA 147	2½ x 1½	0.150	2.66	0.84	0.74	0.94	0.55	1.17	0.12	0.38	0.11	0.36

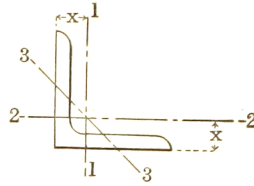
ELEMENTS OF CAR BUILDING BULB ANGLES



Section Index	Sizes	Thick-ness of Web	Wt. per Foot	Area of Section	Axis 1-1				Axis 2-2			
					I	r	S	x	I	r	S	y
	Inches	In.	Lbs.	In. ²	In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.
BA 125	5 x 4½	0.438	19.3	5.66	20.8	1.91	7.9	2.39	7.9	1.18	2.4	1.23
BA 124	5 x 3½	0.375	13.2	3.82	13.5	1.88	4.9	2.22	3.3	0.92	1.2	0.86
BA 122	4 x 3½	0.500	14.3	4.21	8.7	1.44	3.7	1.65	3.9	0.96	1.5	0.99
BA 123	4 x 3½	0.375	11.9	3.48	7.9	1.50	3.5	1.77	3.1	0.94	1.2	0.94

CARNEGIE STEEL COMPANY

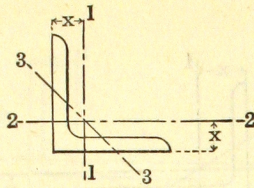
ELEMENTS OF EQUAL ANGLES



Section Index	Size	Thickness Inches	Weight per Foot Pounds	Area of Section In. ²	Axis 1-1 and Axis 2-2				Axis 3-3
					I	r	S	x	r min.
	Inches	In.			In. ⁴	In.	In. ³	In.	In.
A 1	8 x 8	1 1/8	56.9	16.73	98.0	2.42	17.5	2.41	1.55
		1 1/16	54.0	15.87	93.5	2.43	16.7	2.39	1.56
		1	51.0	15.00	89.0	2.44	15.8	2.37	1.56
		15/16	48.1	14.12	84.3	2.44	14.9	2.34	1.56
		7/8	45.0	13.23	79.6	2.45	14.0	2.32	1.56
		13/16	42.0	12.34	74.7	2.46	13.1	2.30	1.57
		3/4	38.9	11.44	69.7	2.47	12.2	2.28	1.57
		11/16	35.8	10.53	64.6	2.48	11.2	2.25	1.58
		5/8	32.7	9.61	59.4	2.49	10.3	2.23	1.58
		9/16	29.6	8.68	54.1	2.50	9.3	2.21	1.58
		1/2	26.4	7.75	48.6	2.51	8.4	2.19	1.58
		1	37.4	11.00	35.5	1.80	8.6	1.86	1.16
		15/16	35.3	10.37	33.7	1.80	8.1	1.84	1.16
		7/8	33.1	9.73	31.9	1.81	7.6	1.82	1.17
A 2	6 x 6	13/16	31.0	9.09	30.1	1.82	7.2	1.80	1.17
		3/4	28.7	8.44	28.2	1.83	6.7	1.78	1.17
		11/16	26.5	7.78	26.2	1.83	6.2	1.75	1.17
		5/8	24.2	7.11	24.2	1.84	5.7	1.73	1.17
		9/16	21.9	6.43	22.1	1.85	5.1	1.71	1.18
		1/2	19.6	5.75	19.9	1.86	4.6	1.68	1.18
		7/16	17.2	5.06	17.7	1.87	4.1	1.66	1.19
		3/8	14.9	4.36	15.4	1.88	3.5	1.64	1.19
		1	30.6	9.00	19.6	1.48	5.8	1.61	0.96
		15/16	28.9	8.50	18.7	1.48	5.5	1.59	0.96
		7/8	27.2	7.98	17.8	1.49	5.2	1.57	0.96
		13/16	25.4	7.47	16.8	1.50	4.9	1.55	0.97
		3/4	23.6	6.94	15.7	1.50	4.5	1.52	0.97
		11/16	21.8	6.40	14.7	1.51	4.2	1.50	0.97
A 3	5 x 5	5/8	20.0	5.86	13.6	1.52	3.9	1.48	0.97
		9/16	18.1	5.31	12.4	1.53	3.5	1.46	0.98
		1/2	16.2	4.75	11.3	1.54	3.2	1.43	0.98
		7/16	14.3	4.18	10.0	1.55	2.8	1.41	0.98
		3/8	12.3	3.61	8.7	1.56	2.4	1.39	0.99
		13/16	19.9	5.84	8.1	1.18	3.0	1.29	0.77
		3/4	18.5	5.44	7.7	1.19	2.8	1.27	0.77
		11/16	17.1	5.03	7.2	1.19	2.6	1.25	0.77
		5/8	15.7	4.61	6.7	1.20	2.4	1.23	0.77
		9/16	14.3	4.18	6.1	1.21	2.2	1.21	0.78
		1/2	12.8	3.75	5.6	1.22	2.0	1.18	0.78
		7/16	11.3	3.31	5.0	1.23	1.8	1.16	0.78
		3/8	9.8	2.86	4.4	1.23	1.5	1.14	0.79
		5/16	8.2	2.40	3.7	1.24	1.3	1.12	0.79
A 4	4 x 4	1/4	6.6	1.94	3.0	1.25	1.0	1.09	0.79

ELEMENTS OF SECTION

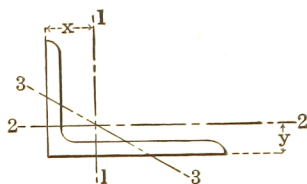
ELEMENTS OF EQUAL ANGLES—Concluded



Section Index	Size	Thickness	Weight per Foot	Area of Section	Axis 1-1 and Axis 2-2				Axis 3-3
					I	r	S	x	r min.
	Inches	In.	Pounds	In. ²	In. ⁴	In.	In. ³	In.	In.
A 5	3½ x 3½	13/16	17.1	5.03	5.3	1.02	2.3	1.17	0.67
		3/4	16.0	4.69	5.0	1.03	2.1	1.15	0.67
		11/16	14.8	4.34	4.7	1.04	2.0	1.12	0.67
		5/8	13.6	3.98	4.3	1.04	1.8	1.10	0.68
		9/16	12.4	3.62	4.0	1.05	1.6	1.08	0.68
		1/2	11.1	3.25	3.6	1.06	1.5	1.06	0.68
		7/16	9.8	2.87	3.3	1.07	1.3	1.04	0.68
		3/8	8.5	2.48	2.9	1.07	1.2	1.01	0.69
		5/16	7.2	2.09	2.5	1.08	0.98	0.99	0.69
		1/4	5.8	1.69	2.0	1.09	0.79	0.97	0.69
		5/8	11.5	3.36	2.6	0.88	1.3	0.98	0.57
		9/16	10.4	3.06	2.4	0.89	1.2	0.95	0.58
A 7	3 x 3	1/2	9.4	2.75	2.2	0.90	1.1	0.93	0.58
		7/16	8.3	2.43	2.0	0.91	0.95	0.91	0.58
		3/8	7.2	2.11	1.8	0.91	0.83	0.89	0.58
		5/16	6.1	1.78	1.5	0.92	0.71	0.87	0.59
		1/4	4.9	1.44	1.2	0.93	0.58	0.84	0.59
		1/2	7.7	2.25	1.2	0.74	0.73	0.81	0.47
		7/16	6.8	2.00	1.1	0.75	0.65	0.78	0.48
		3/8	5.9	1.73	0.98	0.75	0.57	0.76	0.48
A 9	2½ x 2½	5/16	5.0	1.47	0.85	0.76	0.48	0.74	0.49
		1/4	4.1	1.19	0.70	0.77	0.39	0.72	0.49
		3/16	3.07	0.90	0.55	0.78	0.30	0.69	0.49
		1/8	2.08	0.61	0.38	0.79	0.20	0.67	0.50
		7/16	5.3	1.56	0.54	0.59	0.40	0.66	0.39
		3/8	4.7	1.36	0.48	0.59	0.35	0.64	0.39
A 11	2 x 2	5/16	3.92	1.15	0.42	0.60	0.30	0.61	0.39
		1/4	3.19	0.94	0.35	0.61	0.25	0.59	0.39
		3/16	2.44	0.71	0.28	0.62	0.19	0.57	0.40
		1/8	1.65	0.48	0.19	0.63	0.13	0.55	0.40
		7/16	4.6	1.34	0.35	0.51	0.30	0.59	0.33
A 12	1¾ x 1¾	3/8	3.99	1.17	0.31	0.51	0.26	0.57	0.34
		5/16	3.39	1.00	0.27	0.52	0.23	0.55	0.34
		1/4	2.77	0.81	0.23	0.53	0.19	0.53	0.34
		3/16	2.12	0.62	0.18	0.54	0.14	0.51	0.35
		1/8	1.44	0.42	0.13	0.55	0.10	0.48	0.35
A 13	1½ x 1½	3/8	3.35	0.98	0.19	0.44	0.19	0.51	0.29
		5/16	2.86	0.84	0.16	0.44	0.16	0.49	0.29
		1/4	2.34	0.69	0.14	0.45	0.13	0.47	0.29
		3/16	1.80	0.53	0.11	0.46	0.10	0.44	0.29
		1/8	1.23	0.36	0.08	0.46	0.07	0.42	0.30
A 15	1¼ x 1¼	5/16	2.33	0.68	0.09	0.36	0.11	0.42	0.24
		1/4	1.92	0.56	0.08	0.37	0.09	0.40	0.24
		3/16	1.48	0.43	0.06	0.38	0.07	0.38	0.24
		1/8	1.01	0.30	0.04	0.38	0.05	0.35	0.25
A 16	1 x 1	1/4	1.49	0.44	0.04	0.29	0.06	0.34	0.19
		3/16	1.16	0.34	0.03	0.30	0.04	0.32	0.19
		1/8	0.80	0.23	0.02	0.31	0.03	0.30	0.19

CARNEGIE STEEL COMPANY

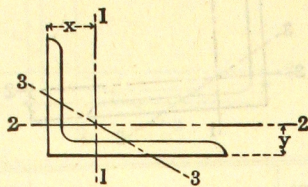
ELEMENTS OF UNEQUAL ANGLES



Section Index	Size	Thickness	Weight per Foot	Area of Section	Axis 1-1				Axis 2-2				Axis 3-3	
					I	r	S	x	I	r	S	y	r min.	
					In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.	In.	
A 18	8 x 6	1	44.2	13.00	80.8	2.49	15.1	2.65	38.8	1.73	8.9	1.65	1.28	
		15/16	41.7	12.25	76.6	2.50	14.3	2.63	36.8	1.73	8.4	1.63	1.28	
		7/8	39.1	11.48	72.3	2.51	13.4	2.61	34.9	1.74	7.9	1.61	1.28	
		13/16	36.5	10.72	67.9	2.52	12.5	2.59	32.8	1.75	7.4	1.59	1.29	
		3/4	33.8	9.94	63.4	2.53	11.7	2.56	30.7	1.76	6.9	1.56	1.29	
		11/16	31.2	9.15	58.8	2.54	10.8	2.54	28.6	1.77	6.4	1.54	1.29	
		5/8	28.5	8.36	54.1	2.54	9.9	2.52	26.3	1.77	5.9	1.52	1.30	
		9/16	25.7	7.56	49.3	2.55	8.9	2.50	24.0	1.78	5.3	1.50	1.30	
		1/2	23.0	6.75	44.3	2.56	8.0	2.47	21.7	1.79	4.8	1.47	1.30	
		7/16	20.2	5.93	39.2	2.57	7.1	2.45	19.3	1.80	4.2	1.45	1.30	
		1	35.7	10.50	66.2	2.51	13.7	3.17	7.8	0.86	3.0	0.92	0.73	
		15/16	33.7	9.90	62.9	2.52	12.9	3.14	7.4	0.87	2.9	0.89	0.73	
A 53	8 x 3 1/2	7/8	31.7	9.30	59.4	2.53	12.2	3.12	7.1	0.87	2.7	0.87	0.73	
		13/16	29.6	8.68	55.9	2.54	11.4	3.10	6.7	0.88	2.5	0.85	0.73	
		3/4	27.5	8.06	52.3	2.55	10.6	3.07	6.3	0.88	2.3	0.82	0.73	
		11/16	25.3	7.43	48.5	2.56	9.8	3.05	5.9	0.89	2.2	0.80	0.73	
		5/8	23.2	6.80	44.7	2.57	9.0	3.03	5.4	0.90	2.0	0.78	0.74	
		9/16	21.0	6.15	40.8	2.57	8.2	3.00	5.0	0.90	1.8	0.75	0.74	
		1/2	18.7	5.50	36.7	2.58	7.3	2.98	4.5	0.91	1.6	0.73	0.74	
		7/16	16.5	4.84	32.5	2.59	6.4	2.95	4.1	0.92	1.5	0.70	0.74	
		1	32.3	9.50	45.4	2.19	10.6	2.71	7.5	0.89	3.0	0.96	0.74	
		15/16	30.5	8.97	43.1	2.19	10.0	2.69	7.2	0.89	2.8	0.94	0.74	
		7/8	28.7	8.42	40.8	2.20	9.4	2.66	6.8	0.90	2.6	0.91	0.74	
		13/16	26.8	7.87	38.4	2.21	8.8	2.64	6.5	0.91	2.5	0.89	0.74	
A 19	7 x 3 1/2	3/4	24.9	7.31	36.0	2.22	8.2	2.62	6.1	0.91	2.3	0.87	0.74	
		11/16	23.0	6.75	33.5	2.23	7.6	2.60	5.7	0.92	2.1	0.85	0.74	
		5/8	21.0	6.17	30.9	2.24	7.0	2.57	5.3	0.93	2.0	0.82	0.75	
		9/16	19.1	5.59	28.2	2.25	6.3	2.55	4.9	0.93	1.8	0.80	0.75	
		1/2	17.0	5.00	25.4	2.25	5.7	2.53	4.4	0.94	1.6	0.78	0.75	
		7/16	15.0	4.40	22.6	2.26	5.0	2.50	4.0	0.95	1.4	0.75	0.76	
		3/8	13.0	3.80	19.6	2.27	4.3	2.48	3.5	0.96	1.3	0.73	0.76	
		1	30.6	9.00	30.8	1.85	8.0	2.17	10.8	1.09	3.8	1.17	0.85	
		15/16	28.9	8.50	29.3	1.86	7.6	2.14	10.3	1.10	3.6	1.14	0.85	
		7/8	27.2	7.98	27.7	1.86	7.2	2.12	9.8	1.11	3.4	1.12	0.86	
		13/16	25.4	7.47	26.1	1.87	6.7	2.10	9.2	1.11	3.2	1.10	0.86	
		3/4	23.6	6.94	24.5	1.88	6.2	2.08	8.7	1.12	3.0	1.08	0.86	
A 20	6 x 4	11/16	21.8	6.40	22.8	1.89	5.8	2.06	8.1	1.13	2.8	1.06	0.86	
		5/8	20.0	5.86	21.1	1.90	5.3	2.03	7.5	1.13	2.5	1.03	0.86	
		9/16	18.1	5.31	19.3	1.90	4.8	2.01	6.9	1.14	2.3	1.01	0.87	
		1/2	16.2	4.75	17.4	1.91	4.3	1.99	6.3	1.15	2.1	0.99	0.87	
		7/16	14.3	4.18	15.5	1.92	3.8	1.96	5.6	1.16	1.8	0.96	0.87	
		3/8	12.3	3.61	13.5	1.93	3.3	1.94	4.9	1.17	1.6	0.94	0.88	

ELEMENTS OF SECTIONS

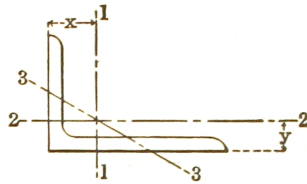
ELEMENTS OF UNEQUAL ANGLES—Continued



Section Index	Size	Thickness Inches	Weight per Foot Lbs.	Area of Section In. ²	Axis 1-1				Axis 2-2				Axis 3-3
					I	r	S	x	I	r	S	y	rmin.
					In. ⁴	In.	In. ³	In.	In. ⁴	In	In. ³	In.	In.
A 216	6 x 3½	1	28.9	8.50	29.2	1.85	7.8	2.26	7.2	0.92	2.9	1.01	0.74
		15/16	27.3	8.03	27.8	1.86	7.4	2.24	6.9	0.93	2.7	0.99	0.74
		7/8	25.7	7.55	26.4	1.87	7.0	2.22	6.6	0.93	2.6	0.97	0.75
		13/16	24.0	7.06	24.9	1.88	6.6	2.20	6.2	0.94	2.4	0.95	0.75
		3/4	22.4	6.56	23.3	1.89	6.1	2.18	5.8	0.94	2.3	0.93	0.75
		11/16	20.6	6.06	21.7	1.89	5.6	2.15	5.5	0.95	2.1	0.90	0.75
		5/8	18.9	5.55	20.1	1.90	5.2	2.13	5.1	0.96	1.9	0.88	0.75
		9/16	17.1	5.03	18.4	1.91	4.7	2.11	4.7	0.96	1.8	0.86	0.75
		1/2	15.3	4.50	16.6	1.92	4.2	2.08	4.3	0.97	1.6	0.83	0.76
		7/16	13.5	3.97	14.8	1.93	3.7	2.06	3.8	0.98	1.4	0.81	0.76
		3/8	11.7	3.42	12.9	1.94	3.3	2.04	3.3	0.99	1.2	0.79	0.77
		5/16	9.8	2.87	10.9	1.95	2.7	2.01	2.9	1.00	1.0	0.76	0.77
A 225	x 4	7/8	24.2	7.11	16.4	1.52	5.0	1.71	9.2	1.14	3.3	1.21	0.84
		13/16	22.7	6.65	15.5	1.53	4.7	1.68	8.7	1.15	3.1	1.18	0.84
		3/4	21.1	6.19	14.6	1.54	4.4	1.66	8.2	1.15	2.9	1.16	0.84
		11/16	19.5	5.72	13.6	1.54	4.1	1.64	7.7	1.16	2.7	1.14	0.84
		5/8	17.8	5.23	12.6	1.55	3.7	1.62	7.1	1.17	2.5	1.12	0.84
		9/16	16.2	4.75	11.6	1.56	3.4	1.60	6.6	1.18	2.3	1.10	0.85
		1/2	14.5	4.25	10.5	1.57	3.1	1.57	6.0	1.18	2.0	1.07	0.85
		7/16	12.8	3.75	9.3	1.58	2.7	1.55	5.3	1.19	1.8	1.05	0.85
		3/8	11.0	3.23	8.1	1.59	2.3	1.53	4.7	1.20	1.6	1.03	0.86
		7/8	22.7	6.67	15.7	1.53	4.9	1.79	6.2	0.96	2.5	1.04	0.75
		13/16	21.3	6.25	14.8	1.54	4.6	1.77	5.9	0.97	2.4	1.02	0.75
		3/4	19.8	5.81	13.9	1.55	4.3	1.75	5.6	0.98	2.2	1.00	0.75
A 235	x 3½	11/16	18.3	5.37	13.0	1.56	4.0	1.72	5.2	0.98	2.1	0.97	0.75
		5/8	16.8	4.92	12.0	1.56	3.7	1.70	4.8	0.99	1.9	0.95	0.75
		9/16	15.2	4.47	11.0	1.57	3.3	1.68	4.4	1.00	1.7	0.93	0.75
		1/2	13.6	4.00	10.0	1.58	3.0	1.66	4.0	1.01	1.6	0.91	0.75
		7/16	12.0	3.53	8.9	1.59	2.6	1.63	3.6	1.01	1.4	0.88	0.76
		3/8	10.4	3.05	7.8	1.60	2.3	1.61	3.2	1.02	1.2	0.86	0.76
		5/16	8.7	2.56	6.6	1.61	1.9	1.59	2.7	1.03	1.0	0.84	0.76
		13/16	19.9	5.84	14.0	1.55	4.5	1.86	3.7	0.80	1.7	0.86	0.64
		3/4	18.5	5.44	13.2	1.55	4.2	1.84	3.5	0.80	1.6	0.84	0.64
		11/16	17.1	5.03	12.3	1.56	3.9	1.82	3.3	0.81	1.5	0.82	0.64
		5/8	15.7	4.61	11.4	1.57	3.5	1.80	3.1	0.81	1.4	0.80	0.64
		9/16	14.3	4.18	10.4	1.58	3.2	1.77	2.8	0.82	1.3	0.77	0.65
A 245	x 3	1/2	12.8	3.75	9.5	1.59	2.9	1.75	2.6	0.83	1.1	0.75	0.65
		7/16	11.3	3.31	8.4	1.60	2.6	1.73	2.3	0.84	1.0	0.73	0.65
		3/8	9.8	2.86	7.4	1.61	2.2	1.70	2.0	0.84	0.89	0.70	0.65
		5/16	8.2	2.40	6.3	1.61	1.9	1.68	1.8	0.85	0.75	0.68	0.66
		13/16	18.5	5.44	13.2	1.55	4.2	1.84	3.5	0.80	1.6	0.84	0.64
		3/4	17.1	5.03	12.3	1.56	3.9	1.82	3.3	0.81	1.5	0.82	0.64

CARNEGIE STEEL COMPANY

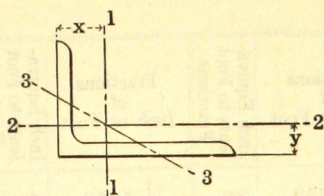
ELEMENTS OF UNEQUAL ANGLES—Continued



Section Index	Size	Thickness	Weight per Foot	Area of Section	Axis 1-1				Axis 2-2				Axis 3-3
					I	r	S	x	I	r	S	y	
	Inches	In.	Lbs.	In. ²	In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.	rmin. In.
A 25	4½ x 3	13/16	18.5	5.43	10.3	1.38	3.6	1.65	3.6	0.81	1.7	0.90	0.64
		3/4	17.3	5.06	9.7	1.39	3.4	1.63	3.4	0.82	1.6	0.88	0.64
		11/16	16.0	4.68	9.1	1.39	3.1	1.60	3.2	0.83	1.5	0.85	0.64
		5/8	14.7	4.30	8.4	1.40	2.9	1.58	3.0	0.83	1.4	0.83	0.64
		9/16	13.3	3.90	7.8	1.41	2.6	1.56	2.8	0.85	1.3	0.81	0.64
		1/2	11.9	3.50	7.0	1.42	2.4	1.54	2.5	0.85	1.1	0.79	0.65
		7/16	10.6	3.09	6.3	1.43	2.1	1.51	2.3	0.85	1.0	0.76	0.65
		3/8	9.1	2.67	5.5	1.44	1.8	1.49	2.0	0.86	0.88	0.74	0.66
		5/16	7.7	2.25	4.7	1.44	1.5	1.47	1.7	0.87	0.75	0.72	0.66
		1/4	6.3	1.83	3.9	1.45	1.2	1.45	1.4	0.88	0.62	0.62	0.66
A 26	4 x 3½	13/16	18.5	5.43	7.8	1.19	2.9	1.36	5.5	1.01	2.3	1.11	0.72
		3/4	17.3	5.06	7.3	1.20	2.8	1.34	5.2	1.01	2.1	1.09	0.72
		11/16	16.0	4.68	6.9	1.21	2.6	1.32	4.9	1.02	2.0	1.07	0.72
		5/8	14.7	4.30	6.4	1.22	2.4	1.29	4.5	1.03	1.8	1.04	0.72
		9/16	13.3	3.90	5.9	1.23	2.1	1.27	4.2	1.03	1.7	1.02	0.72
		1/2	11.9	3.50	5.3	1.23	1.9	1.25	3.8	1.04	1.5	1.00	0.72
		7/16	10.6	3.09	4.8	1.24	1.7	1.23	3.4	1.05	1.3	0.98	0.72
		3/8	9.1	2.67	4.2	1.25	1.5	1.21	3.0	1.06	1.2	0.96	0.73
		5/16	7.7	2.25	3.6	1.26	1.3	1.18	2.6	1.07	1.0	0.93	0.73
		1/4	6.3	1.83	3.0	1.27	1.1	1.16	2.2	1.08	0.8	0.88	0.73
A 27	4 x 3	13/16	17.1	5.03	7.3	1.21	2.9	1.44	3.5	0.83	1.7	0.94	0.64
		3/4	16.0	4.69	6.9	1.22	2.7	1.42	3.3	0.84	1.6	0.92	0.64
		11/16	14.8	4.34	6.5	1.22	2.5	1.39	3.1	0.84	1.5	0.89	0.64
		5/8	13.6	3.98	6.0	1.23	2.3	1.37	2.9	0.85	1.4	0.87	0.64
		9/16	12.4	3.62	5.6	1.24	2.1	1.35	2.7	0.86	1.2	0.85	0.64
		1/2	11.1	3.25	5.0	1.25	1.9	1.33	2.4	0.86	1.1	0.83	0.64
		7/16	9.8	2.87	4.5	1.25	1.7	1.30	2.2	0.87	1.0	0.80	0.64
		3/8	8.5	2.48	4.0	1.26	1.5	1.28	1.9	0.88	0.87	0.78	0.64
		5/16	7.2	2.09	3.4	1.27	1.2	1.26	1.7	0.89	0.74	0.76	0.65
		1/4	5.8	1.69	2.8	1.28	1.0	1.24	1.4	0.89	0.60	0.74	0.65
A 28	3½ x 3	13/16	15.8	4.62	5.0	1.04	2.2	1.23	3.3	0.85	1.7	0.98	0.62
		3/4	14.7	4.31	4.7	1.04	2.1	1.21	3.1	0.85	1.5	0.96	0.62
		11/16	13.6	4.00	4.4	1.05	1.9	1.19	3.0	0.86	1.4	0.94	0.62
		5/8	12.5	3.67	4.1	1.06	1.8	1.17	2.8	0.87	1.3	0.92	0.62
		9/16	11.4	3.34	3.8	1.07	1.6	1.15	2.5	0.87	1.2	0.90	0.62
		1/2	10.2	3.00	3.5	1.07	1.5	1.13	2.3	0.88	1.1	0.88	0.62
		7/16	9.1	2.65	3.1	1.08	1.3	1.10	2.1	0.89	0.98	0.85	0.62
		3/8	7.9	2.30	2.7	1.09	1.1	1.08	1.8	0.90	0.85	0.83	0.62
		5/16	6.6	1.93	2.3	1.10	0.96	1.06	1.6	0.90	0.72	0.81	0.63
		1/4	5.4	1.56	1.9	1.11	0.78	1.04	1.3	0.91	0.58	0.79	0.63
A 29	3½ x 2½	13/16	12.5	3.65	4.1	1.06	1.9	1.27	1.7	0.69	0.99	0.77	0.53
		3/4	11.5	3.36	3.8	1.07	1.7	1.25	1.6	0.69	0.92	0.75	0.53
		11/16	10.4	3.06	3.6	1.08	1.6	1.23	1.5	0.70	0.84	0.73	0.53
		5/8	9.4	2.75	3.2	1.09	1.4	1.20	1.4	0.70	0.76	0.70	0.53
		1/2	8.3	2.43	2.9	1.09	1.3	1.18	1.2	0.71	0.68	0.68	0.54
		7/16	7.2	2.11	2.6	1.10	1.1	1.16	1.1	0.72	0.59	0.66	0.54
		3/8	6.1	1.78	2.2	1.11	0.93	1.14	0.94	0.73	0.50	0.64	0.54
		5/16	4.9	1.44	1.8	1.12	0.75	1.11	0.78	0.74	0.41	0.61	0.54
		1/4	3.7	1.10	1.4	1.13	0.58	1.08	0.62	0.75	0.32	0.54	0.54
		3/16	2.5	0.75	1.0	1.14	0.42	1.05	0.46	0.76	0.23	0.46	0.54

ELEMENTS OF SECTIONS

ELEMENTS OF UNEQUAL ANGLES—Concluded



Section Index	Size	Thickness In.	Weight per Foot Lbs.	Area of Section In.	Axis 1-1				Axis 2-2				Axis 3-3 rmin. In.
					I	r	S	x	I	r	S	y	
					In. ⁴	In.	In. ³	In.	In. ⁴	In.	In. ³	In.	
A 32	3 x 2 1/2	9/16	9.5	2.78	2.3	0.91	1.2	1.02	1.4	0.72	0.82	0.77	0.52
		1/2	8.5	2.50	2.1	0.91	1.0	1.00	1.3	0.72	0.74	0.75	0.52
		7/16	7.6	2.21	1.9	0.92	0.93	0.98	1.2	0.73	0.66	0.73	0.52
		3/8	6.6	1.92	1.7	0.93	0.81	0.96	1.0	0.74	0.58	0.71	0.52
		5/16	5.6	1.62	1.4	0.94	0.69	0.93	0.90	0.74	0.49	0.68	0.53
A 33	3 x 2	1/4	4.5	1.31	1.2	0.95	0.56	0.91	0.74	0.75	0.40	0.66	0.53
		1/2	7.7	2.25	1.9	0.92	1.0	1.08	0.67	0.55	0.47	0.58	0.43
		7/16	6.8	2.00	1.7	0.93	0.89	1.06	0.61	0.55	0.42	0.56	0.43
		3/8	5.9	1.73	1.5	0.94	0.78	1.04	0.54	0.56	0.37	0.54	0.43
		5/16	5.0	1.47	1.3	0.95	0.66	1.02	0.47	0.57	0.32	0.52	0.43
A 35	2 1/2 x 2	1/4	4.1	1.19	1.1	0.95	0.54	0.99	0.39	0.57	0.25	0.49	0.43
		1/2	6.8	2.00	1.1	0.75	0.70	0.88	0.64	0.56	0.46	0.63	0.42
		7/16	6.1	1.78	1.0	0.76	0.62	0.85	0.58	0.57	0.41	0.60	0.42
		3/8	5.3	1.55	0.91	0.77	0.55	0.83	0.51	0.58	0.36	0.58	0.42
		5/16	4.5	1.31	0.79	0.78	0.47	0.81	0.45	0.58	0.31	0.56	0.42
A 48	2 1/2 x 1 1/2	1/4	3.62	1.06	0.65	0.78	0.38	0.79	0.37	0.59	0.25	0.54	0.42
		3/16	2.75	0.81	0.51	0.79	0.29	0.76	0.29	0.60	0.20	0.51	0.43
		1/8	1.86	0.55	0.35	0.80	0.20	0.74	0.20	0.61	0.13	0.49	0.43
		5/16	3.92	1.15	0.71	0.79	0.44	0.90	0.19	0.41	0.17	0.40	0.32
		3/4	3.19	0.94	0.59	0.79	0.36	0.88	0.16	0.41	0.14	0.38	0.32
A 270	2 1/4 x 1 1/2	3/16	2.44	0.72	0.46	0.80	0.28	0.85	0.13	0.42	0.11	0.35	0.33
		1/2	5.6	1.63	0.75	0.68	0.54	0.86	0.26	0.40	0.26	0.48	0.32
		7/16	5.0	1.45	0.68	0.69	0.48	0.83	0.24	0.41	0.23	0.46	0.32
		3/8	4.4	1.27	0.61	0.69	0.42	0.81	0.21	0.41	0.20	0.44	0.32
		5/16	3.66	1.07	0.53	0.70	0.36	0.79	0.19	0.42	0.17	0.42	0.32
A 37	2 x 1 1/2	1/4	2.98	0.88	0.44	0.71	0.30	0.77	0.16	0.42	0.14	0.39	0.32
		3/16	2.28	0.67	0.34	0.72	0.23	0.75	0.12	0.43	0.11	0.37	0.33
		3/8	3.99	1.17	0.43	0.61	0.34	0.71	0.21	0.42	0.20	0.46	0.32
		5/16	3.39	1.00	0.38	0.62	0.29	0.69	0.18	0.42	0.17	0.44	0.32
		1/4	2.77	0.81	0.32	0.62	0.24	0.66	0.15	0.43	0.14	0.41	0.32
A 645	2 x 1 1/4	3/16	2.12	0.62	0.25	0.63	0.18	0.64	0.12	0.44	0.11	0.39	0.32
		1/8	1.44	0.42	0.17	0.64	0.13	0.62	0.09	0.45	0.08	0.37	0.33
		1/4	2.55	0.75	0.30	0.63	0.23	0.71	0.09	0.34	0.10	0.33	0.27
		3/16	1.96	0.57	0.23	0.64	0.18	0.69	0.07	0.35	0.08	0.31	0.27
		1/2	2.34	0.69	0.20	0.54	0.18	0.60	0.09	0.35	0.10	0.35	0.27
A 39	1 3/4 x 1 1/4	3/16	1.80	0.53	0.16	0.55	0.14	0.58	0.07	0.36	0.08	0.33	0.27
		1/8	1.23	0.36	0.11	0.56	0.09	0.56	0.05	0.37	0.05	0.31	0.27
		5/16	2.59	0.76	0.16	0.45	0.16	0.52	0.10	0.35	0.11	0.40	0.26
		1/4	2.13	0.63	0.13	0.46	0.13	0.50	0.08	0.36	0.09	0.38	0.26
		3/16	1.64	0.48	0.10	0.46	0.10	0.48	0.07	0.37	0.07	0.35	0.26

CARNEGIE STEEL COMPANY

DECIMAL OF AN INCH AND OF A FOOT

Fractions of Inch or Foot		Inch Equivalents to Foot Fractions	Fractions of Inch or Foot		Inch Equivalents to Foot Fractions	Fractions of Inch or Foot		Inch Equivalents to Foot Fractions	Fractions of Inch or Foot		Inch Equivalents to Foot Fractions	Fractions of Inch or Foot		Inch Equivalents to Foot Fractions	Fractions of Inch or Foot		Inch Equivalents to Foot Fractions
	.0052	$\frac{1}{16}$		.2552	$\frac{3}{16}$		.5052	$\frac{6}{16}$		.7552	$\frac{9}{16}$						
	.0104	$\frac{1}{8}$		.2604	$\frac{3}{8}$		.5104	$\frac{6}{8}$		.7604	$\frac{9}{8}$						
$\frac{1}{64}$	.015625	$\frac{3}{16}$	$\frac{1}{64}$	.265625	$\frac{3}{16}$	$\frac{3}{64}$	.515625	$\frac{6}{16}$	$\frac{4}{64}$	.765625	$\frac{9}{16}$						
	.0208	$\frac{1}{4}$		.2708	$\frac{3}{4}$		.5208	$\frac{6}{4}$		.7708	$\frac{9}{4}$						
	.0260	$\frac{1}{4}$		.2760	$\frac{3}{4}$		.5260	$\frac{6}{4}$		.7760	$\frac{9}{4}$						
$\frac{1}{32}$	.03125	$\frac{3}{8}$	$\frac{9}{32}$	.28125	$\frac{3}{8}$	$\frac{1}{32}$	.53125	$\frac{6}{8}$	$\frac{2}{32}$	.78125	$\frac{9}{8}$						
	.0365	$\frac{1}{2}$		.2865	$\frac{3}{2}$		.5365	$\frac{6}{2}$		.7865	$\frac{9}{2}$						
	.0417	$\frac{1}{2}$		.2917	$\frac{3}{2}$		.5417	$\frac{6}{2}$		.7917	$\frac{9}{2}$						
$\frac{3}{64}$	.046875	$\frac{9}{16}$	$\frac{1}{64}$	.296875	$\frac{3}{16}$	$\frac{3}{64}$	.546875	$\frac{6}{16}$	$\frac{5}{64}$	.796875	$\frac{9}{16}$						
	.0521	$\frac{9}{8}$		.3021	$\frac{3}{8}$		.5521	$\frac{6}{8}$		.8021	$\frac{9}{8}$						
	.0573	$\frac{1}{16}$		.3073	$\frac{3}{16}$		.5573	$\frac{6}{16}$		.8073	$\frac{9}{16}$						
$\frac{1}{16}$	.0625	$\frac{3}{4}$	$\frac{5}{16}$	.3125	$\frac{3}{4}$	$\frac{1}{16}$	.5625	$\frac{6}{4}$	$\frac{1}{16}$	.8125	$\frac{9}{4}$						
	.0677	$\frac{1}{4}$		.3177	$\frac{3}{4}$		.5677	$\frac{6}{4}$		.8177	$\frac{9}{4}$						
	.0729	$\frac{1}{8}$		.3229	$\frac{3}{8}$		.5729	$\frac{6}{8}$		.8229	$\frac{9}{8}$						
$\frac{5}{64}$	.078125	$\frac{1}{16}$	$\frac{2}{64}$	.328125	$\frac{3}{16}$	$\frac{3}{64}$	.578125	$\frac{6}{16}$	$\frac{5}{64}$	.828125	$\frac{9}{16}$						
	.0833	1		.3333	4		.5833	7		.8333	10						
	.0885	$\frac{1}{16}$		.3385	$\frac{4}{16}$		.5885	$\frac{7}{16}$		.8385	$\frac{10}{16}$						
$\frac{3}{32}$	.09375	$\frac{1}{8}$	$\frac{1}{32}$	.34375	$\frac{4}{8}$	$\frac{1}{32}$	.59375	$\frac{7}{8}$	$\frac{2}{32}$	.84375	$\frac{10}{8}$						
	.0990	$\frac{1}{8}$		.3490	$\frac{4}{8}$		.5990	$\frac{7}{8}$		.8490	$\frac{10}{8}$						
	.1042	$\frac{1}{4}$		.3542	$\frac{4}{4}$		.6042	$\frac{7}{4}$		.8542	$\frac{10}{4}$						
$\frac{7}{64}$	.109375	$\frac{1}{16}$	$\frac{2}{64}$	.359375	$\frac{4}{16}$	$\frac{3}{64}$	.609375	$\frac{7}{16}$	$\frac{5}{64}$	.859375	$\frac{10}{16}$						
	.1146	$\frac{1}{8}$		.3646	$\frac{4}{8}$		.6146	$\frac{7}{8}$		.8646	$\frac{10}{8}$						
	.1198	$\frac{1}{16}$		.3698	$\frac{4}{16}$		.6198	$\frac{7}{16}$		.8698	$\frac{10}{16}$						
$\frac{1}{8}$	.1250	$\frac{1}{2}$	$\frac{3}{8}$	.3750	$\frac{4}{2}$	$\frac{5}{8}$	.6250	$\frac{7}{2}$	$\frac{7}{8}$	.8750	$\frac{10}{2}$						
	.1302	$\frac{1}{16}$		.3802	$\frac{4}{16}$		.6302	$\frac{7}{16}$		.8802	$\frac{10}{16}$						
	.1354	$\frac{1}{8}$		.3854	$\frac{4}{8}$		.6354	$\frac{7}{8}$		.8854	$\frac{10}{8}$						
$\frac{9}{64}$	.140625	$\frac{1}{16}$	$\frac{2}{64}$	.390625	$\frac{4}{16}$	$\frac{4}{64}$	.640625	$\frac{7}{16}$	$\frac{5}{64}$	.890625	$\frac{10}{16}$						
	.1458	$\frac{1}{4}$		.3958	$\frac{4}{4}$		.6458	$\frac{7}{4}$		.8958	$\frac{10}{4}$						
	.1510	$\frac{1}{16}$		.4010	$\frac{4}{16}$		.6510	$\frac{7}{16}$		.9010	$\frac{10}{16}$						
$\frac{5}{32}$	.15625	$\frac{1}{8}$	$\frac{1}{32}$	.40625	$\frac{4}{8}$	$\frac{2}{32}$	.65625	$\frac{7}{8}$	$\frac{2}{32}$	.90625	$\frac{10}{8}$						
	.1615	$\frac{1}{16}$		.4115	$\frac{4}{16}$		.6615	$\frac{7}{16}$		.9115	$\frac{10}{16}$						
	.1667	2		.4167	5		.6667	8		.9167	11						
$\frac{11}{64}$	.171875	$\frac{2}{16}$	$\frac{2}{64}$	.421875	$\frac{5}{16}$	$\frac{4}{64}$	.671875	$\frac{8}{16}$	$\frac{5}{64}$	.921875	$\frac{11}{16}$						
	.1771	$\frac{2}{8}$		.4271	$\frac{5}{8}$		.6771	$\frac{8}{8}$		.9271	$\frac{11}{8}$						
	.1823	$\frac{2}{16}$		.4323	$\frac{5}{16}$		.6823	$\frac{8}{16}$		.9323	$\frac{11}{16}$						
$\frac{3}{16}$	.1875	$\frac{2}{4}$	$\frac{7}{16}$	.4375	$\frac{5}{4}$	$\frac{1}{16}$	.6875	$\frac{8}{4}$	$\frac{1}{16}$	.9375	$\frac{11}{4}$						
	.1927	$\frac{2}{16}$		.4427	$\frac{5}{16}$		.6927	$\frac{8}{16}$		.9427	$\frac{11}{16}$						
	.1979	$\frac{2}{8}$		.4479	$\frac{5}{8}$		.6979	$\frac{8}{8}$		.9479	$\frac{11}{8}$						
$\frac{13}{64}$	.203125	$\frac{2}{16}$	$\frac{2}{64}$	.453125	$\frac{5}{16}$	$\frac{4}{64}$	.703125	$\frac{8}{16}$	$\frac{6}{64}$	.953125	$\frac{11}{16}$						
	.2083	$\frac{2}{12}$		.4583	$\frac{5}{12}$		.7083	$\frac{8}{12}$		.9583	$\frac{11}{12}$						
	.2135	$\frac{2}{16}$		.4635	$\frac{5}{16}$		.7135	$\frac{8}{16}$		.9635	$\frac{11}{16}$						
$\frac{7}{32}$	.21875	$\frac{2}{8}$	$\frac{1}{32}$	.46875	$\frac{5}{8}$	$\frac{2}{32}$	.71875	$\frac{8}{8}$	$\frac{3}{32}$	.96875	$\frac{11}{8}$						
	.2240	$\frac{2}{16}$		.4740	$\frac{5}{16}$		.7240	$\frac{8}{16}$		.9740	$\frac{11}{16}$						
	.2292	$\frac{2}{4}$		.4792	$\frac{5}{4}$		.7292	$\frac{8}{4}$		.9792	$\frac{11}{4}$						
$\frac{15}{64}$	.234375	$\frac{2}{16}$	$\frac{3}{64}$	.484375	$\frac{5}{16}$	$\frac{4}{64}$	.734375	$\frac{8}{16}$	$\frac{6}{64}$	.984375	$\frac{11}{16}$						
	.2396	$\frac{2}{8}$		.4896	$\frac{5}{8}$		.7396	$\frac{8}{8}$		.9896	$\frac{11}{8}$						
	.2448	$\frac{2}{16}$		.4948	$\frac{5}{16}$		.7448	$\frac{8}{16}$		.9948	$\frac{11}{16}$						
$\frac{1}{4}$	.2500	3	$\frac{1}{2}$	.5000	6	$\frac{3}{4}$	.7500	9	1	1.0000	12						

OFFICES

GENERAL OFFICES:

Pittsburgh, Carnegie Building.

DISTRICT OFFICES:

Birmingham, Brown-Marx Building,
Boston, 120 Franklin Street,
Buffalo, The Marine Trust Company Building,
Chicago, 208 South La Salle Street,
Cincinnati, Union Trust Building,
Cleveland, Kirby Building,
Denver, First National Bank Building,
Detroit, Ford Building,
New Orleans, Maison Blanche,
New York, Hudson Terminal, 30 Church Street,
Philadelphia, Widener Building,
Pittsburgh, Carnegie Building,
St. Louis, 506 Olive Street,
St. Paul, Pioneer Building.

EXPORT REPRESENTATIVES:

UNITED STATES STEEL PRODUCTS CO.,
New York, Hudson Terminal, 30 Church Street.

PACIFIC COAST REPRESENTATIVES:

UNITED STATES STEEL PRODUCTS CO., PACIFIC COAST DEPT.
Los Angeles, Jackson Street and Central Avenue,
Portland, Selling Building,
San Francisco, Rialto Building,
Seattle, Fourth Avenue South and Connecticut Street.